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Dermatitis

WHEN some evil genius prompts us humans to consider the dangers that surround us, we are not infrequently left with a feeling of wonder at our continued survival. The many chemists who listened to Dr. H. E. Cox's lucid account of the chemical aspects of dermatitis at the opening meeting of the London Section of the Society of Chemical Industry must have wondered how they had escaped this dread infliction for so long, and, if they could still bear to think, they must be still wondering how much longer they are likely to remain immune. As chemists, we may perhaps reflect that " the devil takes care of his own," and leave it at that. Chemists habitually handle so many of the substances that are known to produce dermatitis in lesser breeds, that it would seem that they should be the first to be attacked. That they are not is a puzzle to which Dr. Cox could give no answer. Possibly chemists, from the need for avoiding errors in their work, wash the contaminating substances from their hands immediately. Or it may be that the multiplicity of substances is in itself their safeguard, the one neutralising the effect of the other. Perhaps it is that they are just naturally thick-skinned; there may be something in this argument, for chemists handle so large a variety of substances, and expose their hands to heat and other agencies so frequently, that they may for the most part have evolved their own protection. If that be so, however, young chemists should not have acquired immunity and may be frequently attacked.

The economic cost of dermatitis to industry is very great. It will be news to many that during 1934 no fewer than 3,216 cases received compensation. This compensation was paid for the most part to workers engaged in handling chemical substances, but there is also another danger to which the law courts bear witness in the onset of dermatitis upon those who use, or only wear, goods containing certain substances. The most frequent causes of dermatitis among the general public rise from substances used or worn by multitudes. Dyed furs, and particularly those dyed with oxidation dyes such as p-phenylenediamene, dimethyl p-phenylenediamene, amino-phenols and toluylene diamines are prone to lead to trouble. Textile dyes give rise to a number of cases, though the percentage of those affected to those using textiles (or furs) is infinitesimal. The difficulty here is that no types seem to be immune, and, in Dr. Cox's words, " it seems likely that almost any synthetic dye if applied to a sufficient number of persons may irritate one or two." All we can do is to note dyes that have a bad record and Dr. Cox remarks that vat dyes are not often concerned in dermatitis cases.

Leather goods, and particularly hat bands, are suspect and seem to cause dermatitis by the agency of free amino compounds or soluble chromates. The accelerators and anti-oxidants used in the manufacture of rubber are potential irritants. It is disturbing to think how great is the danger from hair dyes, and particularly when the skin has been pierced. In Germany alone 10,000,000 packets of hair dyes are used annually and give rise to about 320 cases of dermatitis, of which some 20 are severe. The very infrequency of the onset of the disease—if disease it should be called—provides one of the major difficulties of those who are endeavouring to combat it. It is a surprising fact that flour and sugar have been known to cause this irritation, and this may be partly due to ammonium persulphate. Soaps may set up serious irritation so that washerwomen may develop chronic dermatitis and eczema; caustic soda, phenols, cresols and perfumery bases may be dangerous if present in any quantity. Cosmetics, in particular, are applied under conditions which render it essential that only chemicals of proved harmlessness should be present, as, for example, in eyebrow pencils used when eyebrows have been plucked, for here the dye is introduced subcutaneously. Great care should be exercised in ascribing dermatitis to any particular substance, because once a case is recorded, even without proof, in the technical and scientific press, that substance is ever afterwards suspect.

It appears that dermatitis is not caused generally by complex substances, but that the intermediate compounds used in the manufacture of those substances seem to be more virulent. Body sweat seems to have the power of decomposing some complex substances with formation of harmful products. Inoculation of a person with a minute amount of dermatitis-producing chemical renders that person ever afterwards susceptible to that specific substance; hence some may work for years without being affected, and then may lose their immunity. Generally speaking, to produce dermatitis a substance must penetrate beneath the skin, or must affect the natural workings of the skin so as to cause irritation beneath it. It is thus highly important to avoid injury to the skin in the chemical factory. When all this has been taken into account, certain persons seem to have an idiosyncracy for the disease. To avoid dermatitis in industry, the greatest single step that could be taken would theoretically be to discover a test for this hypersensitiveness. Unfortunately, it seems that a test that reveals sensitiveness to one substance does not necessarily indicate sensitiveness or immunity to another substance. Cleanliness and frequent washing are the best methods of avoiding dermatitis in the factory, coupled with the wearing of suitable garments.

Notes and Comments

Chemicals at the B.I.F.

IN the opinion of the Association of British Chemical Manufacturers, which has been responsible for several years for the organisation of the chemical section at the British Industries Fair, the section cannot yet be regarded as worthy of the chemical industry. A strong appeal was therefore made in the annual report presented at the twentieth annual meeting of the Association last week for increased support on the occasion of the 1937 Fair. Considerable changes will take place at Olympia owing to the opening of the new Earl's Court buildings, and it is hoped that the chemical section will be moved to a more prominent position opposite the Addison Road entrance. Unless the section is larger and better supported, however, it will not be able to substantiate its claims for greater prominence. The plans for the 1937 Fair have been considered and two important decisions have already been reached. One is that the Association's stand shall be in a more prominent place; the other is that it shall be used for general purposes and that the system adopted for several years of displaying an outstanding new product shall be discontinued. Every chemical manufacturer who occupies space at the 1937 Fair should seek to further the interests of the industry as a whole, and not merely his own.

The Smoke Abatement Exhibition

THE National Smoke Abatement Society has put on view ocular demonstration of the evil effects of smoke and of the measures that are being taken to improve the position. From an industrial point of view, the emission of smoke is unavoidable because it emanates from outside industry, from the domestic grate. A considerable sum of money is lost each year in industry by reason of illness, and yet more is lost because of people being out-of-sorts, a condition which can in many instances be quickly remedied by ultra-violet light. We recollect an ultra-violet apparatus at one of our northern universities that in winter-time was in constant daily demand for treating members of the University staff who were troubled with colds and similar ailments, all of which vanished rapidly —we nearly said " like smoke "—before the beneficent rays. That is by contraries a practical illustration of the undoubted evil effects of smoke. It is of real importance to industry that the atmosphere of our cities should be drastically improved. There is also the direct loss caused by damage to vegetation and crops. Damage to buildings is due to acids liberated during combustion. It may be true that the average English family creates more than its own weight in smoke every year; it is also true that the same family will generate from once to twice its own weight of sulphur dioxide and that every chimney in the country (except two or three power stations) is doing the same in greater or less degree. There is something like 2,000,000 tons of SO_2 thrown into the atmosphere every year from the combustion of coal and coke; it is not surprising that the exhibition contains specimens and photographs of stonework and bricks damaged by " smoke." This phase of the atmospheric pollution problem remains practically untouched. If we abolish smoke, shall we also abolish the corrosion of materials by sulphur acids? That question remains unanswered. If we find that the emission of sulphur acids arising from the combustion of coal must be prevented, how can we prevent it save in the largest installations? The emission of acid gases from the chemical industry is watched closely by the alkali inspectors; when will they have equal power to deal with acid emission from solid fuel-burning installations? The problem of smoke abatement still contains more questions than solutions.

Conveyance of Goods

IT is always a matter of difficulty to decide whether goods should be conveyed by road or rail and whether the public carriers should be entrusted with the task or whether a firm should run its own fleet of motor vehicles. The recently-issued railway returns when collated with the reports of the Traffic Commissioners in the light of the inside knowledge possessed by the motor manufacturers provides a basis for estimating the proportions in which the inland traffic is divided between road and rail. On this basis it has been estimated that road transport during 1935 carried one-quarter of the total load and that this amounted to just less than 6,000 million ton-miles, leaving 18,000 ton-miles for the railways. For the higher classes of merchandise, livestock and other classes where speed is desirable or essential, the road carried some 50 per cent. of the total. Some chemical manufacturers run their own fleets of motor vans, and these are particularly appropriate when deliveries have to be made at a number of places. Who, for example, has not noticed the magnificent vehicles of British Drug Houses? There is a growing tendency in certain directions to avoid unduly complicating business management by introducing types of work with which the organisation is unfamiliar and unquestionably the transport of goods is not closely connected with the operations of manufacturing chemistry. This, on any extended scale, is a job for the expert and unless the fleet of vehicles is likely to be so numerous that the services of a trained traffic manager can be retained to manage them, it is probably false economy to undertake transportation in addition to production.

More Oil from Coal

IT was only a little over five months ago that THE CHEMICAL AGE announced the decision of Low Temperature Carbonisation, Ltd., to erect a new plant for the production of smokeless fuel, oil and petrol adjacent to the Bolsover Colliery, yet such has been the progress of the scheme that the plant will be in operation a fortnight hence, and in a short time it will be the largest plant of its kind in the world. Although over 12,000,000 gal. of petrol and coal oil per annum will be produced by the company's four plants, still further developments are contemplated. Drawings are being prepared for a central oil distillation plant to deal with the products of two or three plants sufficiently close together to make transport an economic propostion. The aggregate contribution which the company is making, both to the national wealth and the absorption of labour, is of considerable dimensions, to say nothing of the reduction of our dependence upon foreign sources of fuel supplies.

Association of British Chemical Manufacturers

Satisfactory Outcome of Two Major Problems

THE twentieth annual general meeting of the Association of British Chemical Manufacturers was held in London on October 8 under the chairmanship of Mr. E. Wallace. "This has been another very busy year and we are fortunate that we are able to record the satisfactory outcome of our two major problems, namely, the new Poisons Legislation and the future of the Key Industry Duties," said Mr. Wallace in moving the adoption of the annual report. "The success of our efforts is a striking testimony to the value of our Association to the chemical manufacturers of the country. Without a strong Association it might have been a very different story. We want to be even stronger than we are, and to be completely representative of the British chemical industry. We are glad to note the accession of two important firms (Bakelite, Ltd., and E. P. Potter and Co., Ltd.). Since it was written the new firm of N. H. Graesser has joined us; we all know Mr. Norman Graesser and the help he has been to the Association in the past. There are still a few chemical manufacturers outside and the council would be glad if members would use their best efforts to bring them into the fold. There is hardly a thing we do which would not be to their direct advantage."

Deaths During the Year

The chairman referred with regret to the death of two gentlemen who had been of great service to the Association, Mr. Chambers, who was its solicitor, and Mr. Fergusson, who was the greatest British authority on tar. In the last few weeks they had to mourn the loss of Mr. Rintoul, one of the research managers of Imperial Chemical Industries, Ltd. His modest and unassuming nature, his willing helpfulness at all times and his delightful personality endeared him to all his chemical colleagues. He was one of the Association's representatives on the recently formed Chemical Council.

On the subject of exhibitions Mr. Wallace commended the council's appeal for better support of the chemical section at the British Industries Fair, especially in view of the fact that the section would now occupy the front position at the Addison Road entrance. Such a position was due to the industry because of its great basic importance as the provider of raw materials for practically every one of our industrial activities. The council realised the difficulties of members as regards participation, but at the same time felt that for the prestige of the industry the section should be far larger and far more representative.

He congratulated the fine chemical group on its wise move in appointing a special legislation sub-committee to take immediate action as soon as there was even the prospect of Government or Private Members' Bills being introduced into Parliament likely to affect the fine chemical industry.

The Import Duties Advisory Committee

On behalf of the Association he desired to indicate his warmest approval of the far-seeing and impartial manner in which Lord May and his colleagues on the Import Duties Advisory Committee had dealt with the difficult problems that had come before them. Though at times members might consider that the procedure was a little slow, they must admire the thorough and sympathetic manner in which every case was investigated and admit that their final decisions were governed by what they delieved to be in the best interests of industry as a whole. Members of the Association could congratulate themselves that no country had been able to administer its tariffs in such a successful manner, free from all political intrigue and jobbery.

The production figures for 1934 were now available, showing the figures by value for the four groups mentioned in the report for the years 1930, 1933 and 1934:—

	1930. £	1933. £	1934. £
Drugs, medicines and medicinal preparations	14,524	16,496	16,937
Dyes and dyestuffs	4,629	5,987	6,707
Coal tar products (other than dyes and dyestuffs)	5,253	4,637	5,965
Other chemical manufactures ..	27,127	29,866	31,094
	£51,533	£56,986	£60,603

The figures in the table did not include those from the fertiliser, disinfectant, glue and allied trades, the soap, candle and perfumery trades, the paint, colour and varnish trades, the oil and tallow trades, the explosives and fireworks trades, the starch and polishes trades or the ink, gum and sealing wax trades. The data, therefore, related to the chemical industry in the more restricted sense. While the 1933 figure showed an increase of £5,500,000, or 10 per cent. over 1930, 1934 exceeded 1930 by £9,000,000, or 18 per cent. Taking the four groups in turn, 1933 and 1934 showed increases of 13 per cent. and 17 per cent. respectively over 1930 for drugs, medicines and medicinal preparations; increases of 29 per cent. and 45 per cent. for dyes and dyestuffs; there was a decrease of 12 per cent. in 1933 for coal tar products other than dyes and dyestuffs, but by 1934 this had changed to an increase of 12 per cent. For other chemical manufactures the increases were 10 per cent. and 15 per cent. respectively. This was a gratifying position and was a good index of the general recovery of British industry over these years.

Imports Still Increasing

Turning to the external trade of the country for which later figures were available they found that the exports of chemicals, drugs, dyes and colours increased from £18,500,000 in 1933 to £19,500,000 in 1934 and £20,500,000 in 1935. The first eight months of this year (1936) showed that we were just about maintaining the 1935 level. The import figures were not so satisfactory, bearing in mind that the bulk of the imports were in respect of products for which there was adequate production in this country. The imports, which were close on £10,000,000 in 1933, had increased to £11,250,000 in 1934 and to £11,500,000 in 1935. If re-exports were deducted, the increases were still greater as the re-exports of just over £1,000,000 in 1933 were about halved in 1935. The figures for the first eight months of this year showed that the increase in imports was continuing. This was a state of affairs which they ought to examine with great care and take such steps as they could to counteract it.

There was no doubt about the value of the Ottawa agreements to British trade. All the anticipated benefits had not, however, accrued for reasons which were not expected when the agreements were made. They therefore required to be revised in various directions. The Association would continue to keep in close touch with the Government during the negotiations. An important point was the protection of the United Kingdom maker against Empire competition, especially when the competitive industry was protected in its own market. It was hoped that the Government would take the necessary powers to deal with such cases. The recommendations of the Ottawa Conference for the rationalisation of production on an Empire basis had made little or no progress, and much could not be expected until the industries in the Empire were organised on such a basis that they could negotiate collectively on such matters and enforce their decisions. This would require trade associations to possess

greater powers than they had on their present voluntary basis.

Though little had been done in connection with foreign trade agreements during the past year, there was likely to be considerably more activity in this direction in the year ahead as the treaties concluded after Ottawa had reached the end of the initial periods for which they were made. The Association would have to review the experience of the last three years very carefully as soon as negotiations were commenced. The purchase agreements with a number of northern European countries, which gave promise of considerable benefit to this country, would require to be strengthened as in their present form they could not be said to have increased our trade in the way that was hoped.

The safety activities of the Association were now too well known to require any comment. The work of the committee of the Medical Research Council on industrial solvents should be of the greatest value, especially to the industries using solvents. The manufacturers were fully appreciative of the disagreeable properties of these substances and took adequate care in handling them; the same could not be said of the users and it was to this lack of what might fairly be described as common-sense precautions that most of the trouble with solvents was due.

Poisons Legislation

The chemical industry had undoubtedly secured substantial benefits from the Association's handling of the draft poisons legislation during the past two years. Other industries outside the chemical field had also profited largely from the modifications and concessions which the Association had been able to secure. The subject was one of extreme complexity and necessitated a large amount of detailed work in elucidating the often somewhat ambiguous wording of the draft regulations to members and those of affiliated organisations in collecting and collating their suggestions and in securing agreement or compromise on all points among all the chemical associations affected. The fact that the Association and its affiliated organisations were able to submit a single brief and to speak with one voice was undoubtedly the most important factor in their success, but the care that was taken to see that no proposals were submitted which would jeopardise the safety of the public was a powerful contributory means of impressing the Home Office as to the merits of their case. Difficulties had already arisen in the short period that the Poisons Rules had been in force, and representations on them had been made to the Home Office for consideration by the Poisons Board at the meetings which it would shortly hold.

Air Raid Precautions

The unsettled state of Europe emphasised the importance of making adequate arrangements in peace for the protection of factories against air attacks in the unfortunate event of war. Reports of two meetings mentioned in the report had provided members with a large amount of useful information as to the nature of this very complex problem. When members had had a little longer to study the matter, these discussions would be renewed so that by the pooling of information and ideas they might all be enabled to make the best possible arrangements at the minimum cost.

The reports of the three most active groups of the Association, namely, those dealing with tar, fine chemicals and dyestuffs, indicated how closely these groups watched the interests of their particular industries. The Association was well satisfied with the action taken by the Government in regard to the key industry duties. The fine chemical group was to be congratulated on the excellence of the case which it presented. It had been well repaid for the work which it had done during the past few years in collecting detailed data in regard to production and allied matters as it was thereby enabled to submit a fully documented memorandum proving beyond any shadow of doubt the value to the community of the key industry duties on fine chemicals. With the further period of protection it would be able to plan long period schemes of research and development which would be of the greatest national utility both in peace and in war.

The traffic committee was the most active committee which the Association possessed and is was to be congratulated on its excellent work during the past year. The results of its labours in regard to rates and conditions of transport affected the whole industry, and the direct immediate financial benefits which accrued from this aspect of the Association's work must repay members' subscriptions many times over. The Association desired to put on record its keen appreciation of the great services performed by Mr. Hoyle during the many years he was chairman of the traffic committee and to hope that he might long be able to enjoy the rest which he had so well earned.

Tribute to the Staff

Members were at last realising that the Association was willing to deal with any problem relating to their industry other than questions relating to wages and hours and conditions of work and were more and more utilising these services to many of which no reference could be made in the report. In conclusion, Mr. Wallace expressed the Association's indebtedness to the general manager and his staff for their unremitting attention to the work of the Association. Every problem was tackled with energy and enthusiasm and carried through to completeness, however onerous might be the work involved. They were indeed fortunate in their staff and they wished them to know how fully they appreciated their loyalty and devotion and all they did for the Association.

The following elections were made at the meeting: President, Dr. E. F. Armstrong; vice-presidents, Dr. C. Carpenter, Dr. F. H. Carr, Sir Christopher Clayton, Mr. C. A. Hill, Sir David Milne-Watson and Mr. R. G. Perry; honorary vice-presidents, Sir Martin O. Forster, Mr. D. Lloyd Howard, Sir Harry McGowan and Sir Robert Mond.

The following members of council, who retired in rotation, were re-elected: Mr. F. W. Bain, Mr. H. Ballantyne, Mr. E. V. Evans, Mr. N. N. Holden, Dr. P. C. C. Isherwood, Mr. C. F. Merriam and Mr. W. J. U. Woolcock. Messrs. Feasey, Hull and Feasey, chartered accountants, were re-elected as auditors.

The Annual Dinner

There was a larger attendance than usual at the annual dinner of the Asociation, which was held at Grosvenor House, Park Lane, on October 8, under the chairmanship of Mr. E. Wallace. The principal guest was Sir Thomas Inskip, Minister for the Co-ordination of Defence, who responded to the toast of the guests, together with Sir Gilbert Morgan. Other noteworthy guests were Lord May, Lord Leverhulme (president of the Society of Chemical Industry), Sir Harold Brown, Sir Edward Crowe, Sir Hugh Ellis, Sir Christopher Clayton, Dr. R. H. Pickard (president of the Institute of Chemistry and chairman of the Chemical Council), Sir Allan Powell, Sir Alfred Hurst, Dr. J. J. Fox, and Professor Edward Mellanby. In proposing the toast of the Association, Dr. R. H. Pickard made a strong appeal on behalf of the Chemical Council to all sections of the chemical industry for financial support. Other speakers, in addition to the chairman, were Mr. N. N. Holden, who proposed the toast of the guests, and Mr. J. Davidson Pratt, who responded to the toast of the officers of the Association and paid tribute to the members of his staff.

PAPERS read or published by the staff of the National Physical Laboratory during September included: "The determination of the specific heat of gases at high temperatures by the sound velocity method. II. Carbon Dioxide." By G. G. Sherratt and E. Griffiths. "Proceedings of the Royal Society, 'A'," *156*, 504; "X-rays and enamel histology." By J. Thewlis. "British Dental Journal," *61*, 270; and "Shrinkage during solidification of aluminium alloys." By V. H. Stott. "Journal of the Institute of Metals" (July, 1936).

New Smokeless Fuel Plant at Bolsover

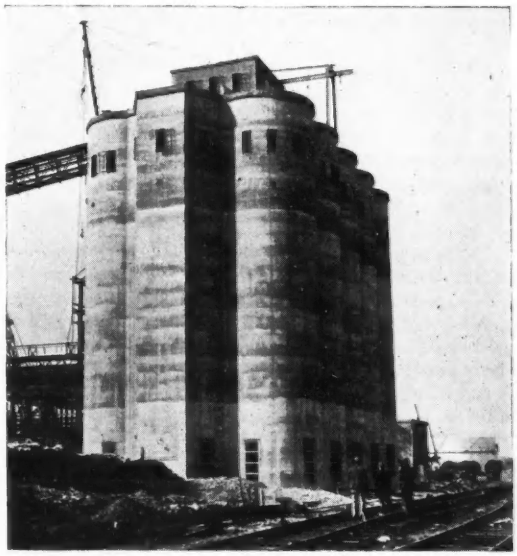
A Record in Construction

COLONEL W. A. BRISTOW, chairman of Low Temperature Carbonisation, Ltd., conducted a party of visitors from London over what, when completed, will be the largest plant in the world for making smokeless fuel, at Bolsover, near Chesterfield, on Tuesday. Besides producing large quantities of solid smokeless fuel for domestic consumption, the new plant will make an important contribution to the increased home production of oil and petrol from coal. The first batteries were lit on Tuesday morning, and although the construction of the works is still far from complete, it is hoped to commence operations by the beginning of November.

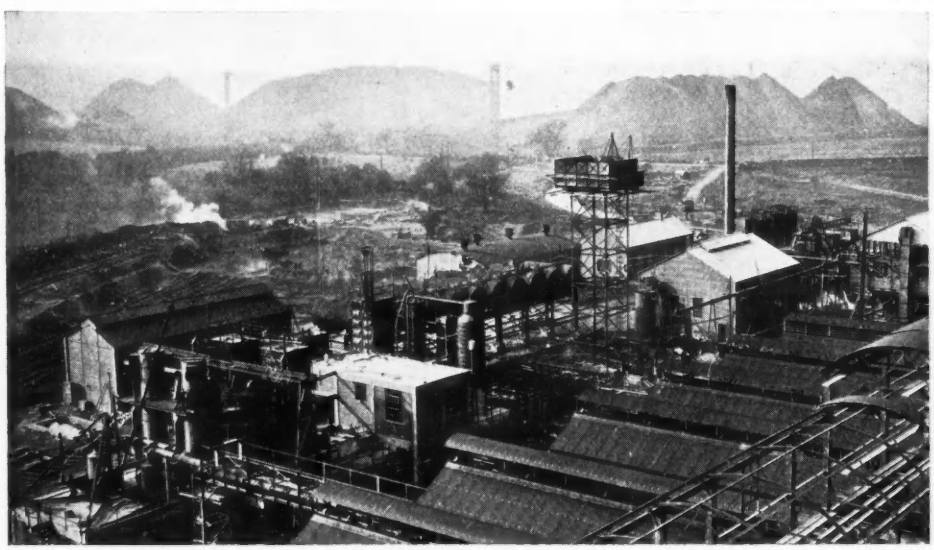
The first part of the plant consists of 288 retorts, with a capacity for dealing with 500 tons of coal a day. A record has been established in the building of the Bolsover plant. Operations began on May 18, just about five months ago. The whole of the plant has been made in the United Kingdom, and many of the features have not previously been incorporated in any plant of this description.

The steel industry deserves great credit for the successful production of the retorts from the special alloys. The building of the plant has been carried out under the constant supervision of the inspecting engineers of Low Temperature Carbonisation, Ltd., whose subsidiary, Derby Coalite, Ltd., will be responsible for running the plant.

The contractors are: Simon-Carves, Ltd., Cheadle Heath, Stockport; Babcock and Wilcox, Ltd., Renfrew; Naylor Brothers, Ltd., Golborne, Lancashire; Davy Brothers, Ltd., Park Iron Works, Sheffield; Qualter Hall and Co., Ltd., Barnsley; E. J. and J. Pearson, Ltd., Stourbridge; and The Horsehay Co., Ltd., Wellington, Salop.



The sixteen coal bunkers, 70ft. in height, which have a total capacity of 2,500 tons.



General view of the Bolsover plant from the top of the coal bunkers.

The Bolsover works are the fourth built by Low Temperature Carbonisation, Ltd. The first has been working continuously, day and night, at Barugh, near Barnsley, since July, 1927. The second has also been working continuously, at Askern, near Doncaster, since July, 1929. The third coalite plant, which was built at East Greenwich on the site of the South Metropolitan Gas Co.—by whom it is operated under licence—was started in 1930 and has operated without interruption since. Since 1927 the company has carbonised approximately 2,000,000 tons of coal, from which have been produced 1,400,000 tons of coalite and 180,000 tons of coal oil and coal petrol. The four plants will now be able to carbonise 1,600 tons of coal per day, which will give an annual output of 380,000 tons of coalite and over 12,000,000 gal. of petrol and coal oil.

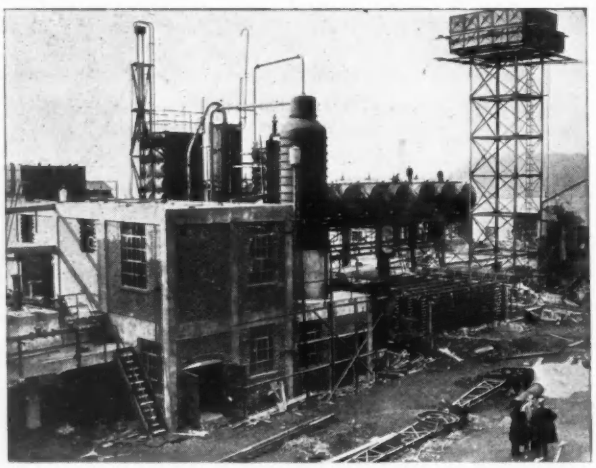
The coal used at Bolsover is washed smalls, in size from half-an-inch down to powder. After leaving the washer at the colliery the coal is taken in wagons to the wagon tippler at the coalite plant where, by an ingenious contrivance, in addition to being tippled, the wagon of coal is weighed both full and empty. From the tippler hopper the coal is transported by a band conveyor to the 16 coal bunkers where it is sorted and drained. The total capacity of the bunkers is 2,500 tons, and coals from different seams are sorted in separate compartments ready for blending.

When the coal is drained sufficiently, supplies are drawn from the bottom of the bunkers and there automatically placed on a mixing belt and conveyed mechanically to the overhead bunkers directly over the tops of the eight batteries of retorts. A coal breaker has been installed in this line so that if necessary large coal can be used and broken to the requisite size on its way to the bunkers. From the overhead bunker, the coal is passed to travelling skips which are suspended on rails over

the tops of the retorts, and each skip loads 18 retorts in a line. The retorts consist of a special alloy steel each standing in the centre of a radiation chamber from the walls of which it is heated. No flame comes in contact with the retorts, and, owing to the special material and method of operation, they can stand many years' continuous operation at high temperatures.

After the carbonising period of four hours the coke is ejected into hermetically sealed cooling chambers, where, after four hours' cooling, it is discharged on tip-tray conveyors to the main conveyor belts which in turn feed the screening and loading plant.

The gas emitted from the retorts during the carbonising period is led through the separate water-cooled off-take pipes into the hydraulic mains where most of the oil is condensed. The remainder passes on to electro-static precipitators, where it is subjected to a static discharge of 60,000 volts. In addition to thoroughly cleansing the gas, this has the effect of raising the performance value of the petrol. The gas, after



The Oil and Petrol Plant.

leaving the electro-static precipitator passes to the ammonia plant where the ammonia is extracted from the gas by washing with dilute sulphuric acid.

On leaving the ammonia plant, the gas is cooled by being passed through water-cooled condensers. It then proceeds to a static washer which extracts the petrol, passing it to a still where the wash oil is removed, the crude spirit then being pumped to the storage tanks. The retorts are heated by the residual fixed gas produced in the process, but there is also an independent gas producer plant installed for preliminary heating up and to act as a stand-by. The works will be completed by the addition of a coal oil distillation plant and a plant for the production of Diesel oil and tar acids.

The bituminous coal contains approximately 55 per cent. of carbon; 35 per cent. volatile matter; the remaining 10 per cent. consisting of ash, sulphur and moisture. When the coal is heated to about 600° C., the small coal forms into a hard coke which is discharged from the retorts in pieces which automatically break themselves into lumps of suitable size for domestic use. The finished coalite consists of approximately 81 per cent. of carbon, 10 per cent. volatile matter and 8 per cent. of ash, sulphur and moisture. The coke has a unique porosity-density ratio rendering it very easy to light.

The petrol produced from the coal is very volatile and has high-performance characteristics. It is suitable for modern aircraft engines without any mixture of benzole or dopes, and the crude coal oil is particularly elastic in composition and can be easily cracked or distilled into any required fractions.

The following is an estimate of the employment resulting from the erection of the new plant:—Employed in building the plant: Men making plant and transporting it to site, 600; men preparing site and foundation, 200; builders of the plant, 400; total 1,200. Men to whom the plant will give employment: Miners getting coal, 400; employees of carbonising plant, 200; men at oil distillation plant and petrol refining plant, 60; men at Diesel oil and tar acid plant, 60; total, 720. In addition to these two groups is the considerable number engaged in distributing 120,000 tons of products to the buyers.

Further Plants Comtemplated

Colonel Bristow, addressing the visitors at the works, said this was the fourth coalite plant the company had erected since they were first attracted some years ago by the great possibilities of the bituminous coal of this country, and particularly of the wonderful Barnsley seam, for the manufacture of smokeless fuel and the recovery of oils and petrol. The Bolsover plant was destined to become one of the most important plants, and they were at present negotiating in three different quarters with a view to the erection of further plants. They were also getting out drawings for a central oil distillation plant which would take the oil from two or three plants sufficiently close together to make the transport an economic proposition. They intended to go on with that policy. It had been shown that the public wanted the smokeless fuel that the company was making. The oil and petrol were all sold before the works were built; there was no difficulty whatever in disposing of them. The country was more in need of the oil and petrol than ever before, because in the past few years, for the first time, the defensive forces had gone in for something outside their own control, namely, oil fuel.

There was no reason why that great backbone of the country, the Barnsley seam, which extended from where they were standing to the North Sea, and possibly a long way under the sea, should not provide an enormous quantity of oil for this country. At the present time, however, they were not supplying one per cent. of the oil fuel required in this country. There was an enormous market awaiting expansion, and the most important question was how quickly they could do it. The market for smokeless fuel was much greater than a year ago.

Government Sympathetic

The Government was very sympathetic towards the objects they had in view. They had received great help from the Mines Department, represented that day by the presence of Sir Arthur Faulkner; the Air Ministry, who took their petrol; the Admiralty, who gave them their first contract for fuel oil; the Department of Scientific and Industrial Research, and the Fuel Research Board. More money was made out of every ton of coal they treated than out of any ton of coal treated or utilised in any other way in this country. For every ton of coal they took, worth from 11s. to 12s., they increased the value by at least 20s. In effect they were adding millions to the national wealth of the country, in addition to creating a large volume of employment.

THE 1935-36 French fertiliser season showed a somewhat more satisfactory tendency than the previous season for nitrogen, but the situation remained stationary as far as phosphate and potash fertilisers were concerned. The Government policy of revalorisation of agricultural products helped stop the downward movement which had become general and purchases of fertilisers by agriculturists during the early months of 1936 showed a definite improvement.

REFINED borax and sodium perborate are manufactured in Belgium from imported mineral raw materials. The two factories now operating, with a total annual productive capacity of about 3,000 metric tons, fail to provide for the needs of the Belgian market, and refined borax is imported from the United States, Italy and France. Sodium perborate is finding an increasing outlet in detergent compositions.

Letters to the Editor

The Structure of Benzene

SIR,—On February 3, 1887, Henry E. Armstrong, then a young gentleman, read a paper before the Chemical Society of London which was duly printed in the Society's Transactions (1887, vol. *57*, p. 258) and in which he put forward the so-called centric formula for benzene; the enunciation of this formula, still the most satisfactory representation of the behaviour of the hydrocarbon, resulted from digestion by keen intelligence of the mass of facts concerning aromatic compounds known half a century ago.

Professor Adolf von Baeyer was elected an honorary member of the Chemical Society in 1876. In this quality he received the above journal and no doubt read Armstrong's paper of 1887; he must have done so, for fifty years ago chemical journals were few and the expert would have missed his vitamines had he not consumed everything. Baeyer handed a paper to Liebig's Annalen on February 26, 1888, which was duly published (Annalen, 1888, *245*, 120) in which he restated the centric formula as most appropriately expressing the character of benzene. It is clear what had happened. Baeyer had adsorbed the paper of a year before and had metabolised the Armstrong portion, retaining the centric formula part in his mind.

Professor Armstrong is a valued contributor to your columns and, in view of the situation stated above, it would be interesting to know why you, in your "Notes and Comments" (p. 306), and also the Chemical Society in the papers which have aroused your enthusiasm, ascribe the centric formula of benzene to Baeyer. Even the most modern German textbooks usually refer to it as the Armstrong and Baeyer formula.

Although it has nothing to do with the foregoing, it may be mentioned that none of our Committees on Chemical Nomenclature would approve of your translation of the honoured German name of "Thiele" as "Thick."—Yours faithfully,

W. J. POPE.

The Chemical Laboratory,
The University,
Cambridge.

Another Reply to "External Graduate"

SIR,— I would like to add a rejoinder to "External Graduate's" letter in THE CHEMICAL AGE of October 3, in reference to Professor Philip's address to the British Association. The section of the address on "The Need for Chemical Direction" is a most important expression of truth and common sense. Now to reply briefly to "External Graduate's" numbered paragraphs:

Par 1. He might have added "and if he fails at that put him on the directorate."

Par 2. What about the school friends of the brothers and sisters—they must not be forgotten.

Par 3. The "trainee" system is bad. The "trainee" is usually some favoured one, perhaps a friend of the brothers and sisters above, or an offspring of same. They are brought in to be coached and shown; passed from post to post and then put in authority. I can speak of this from experience. The governor of a private company, in introducing one who had never been in a works and knew not a word of chemistry, asked me how long I thought it would take to get him ready to take charge, not of a department, but of a certain works. At another works, with a directorate, some little time later, a man whom I knew was intended to have one of the plums, had been with me; I was asked if I thought he would make a manager. He, too, knew no chemistry.

I have had a few men possessing degrees. Some of them could analyse a simple mixture with the aid of the book, and perhaps make a quantitative analysis, but if a sample of damaged goods were given them they could not, even though it was only a metallic oxide stain, find the cause. All the same, they have been put to control and direct.

I do not see how a "trainee" can ever become a successful manager or even a chemical director. He begins too late in life. He is past the age at which he wants to take his jacket off and get into it.

I take it that "External Graduate" is connected with either the bleaching, dyeing or calico printing industries—perhaps all three. The only time and place to begin is when young, and at the bottom where processes begin, as did the men who successfully began the businesses and the few who keep things going. He should begin with a test tube in one hand and a plaiting stick in the other. To this, of course, must be added natural ability, initiative, force and resource.

I remember the time when the man who started these trades had no books; when test tubes and glasses in which we could boil water were wonderful curiosities. Having no books, they were obliged to use their brains.

I never had a "trainee" other than those thrust on me. I would not take, even with a premium, a youth who had not worked in the works. The foremen, whose work was not all mechanical, must have spent some time in the laboratory. Some of these now fill important positions as directors and managers in the trade; unfortunately, some are our foreign competitors.

Our bad trade and loss of profits is due not so much to Japanese competition as to resting on our oars. Incompetent men are in the leading places; and fools in the driving places. The manager of a works must be a chemist. If he is not, and there is a chemist and the works succeeds, it is the chemist who is managing. A manager without chemistry is like a driver with a long whip and a long team of oxen pulling a wagon. A chemist manager, scientific practitioner, is like one steering a motor wagon. The manager whips up the men to get the last ounce out of them. The cashier pays the men for their time. But it is the chemist who makes most use of men and material. It is he who makes the profit.—Yours faithfully,

ANOTHER EXTERNAL GRADUATE.

The Evolution of Rayon

An Address to the Liverpool Rotary Club

AN address on "Rayon" was given before members of the Liverpool Rotary Club, on October 8, by Mr. A. Davenhill, of the British Enka Co., Ltd., Aintree.

The speaker pointed out that rayon was a new fibre which differed from other fibres. All other fibres consisted of short staples which had to be twisted into long threads. Rayon fibre was a continuous fine filament which could be turned out in lengths of ten miles or more. The basis of rayon was wood-pulp. There were three processes of manufacture—the viscose process, which produced rayon; the acetate process, which resulted in a similar product sold under the name of Celanese; and the copper ammonium process. A Liverpool bank clerk was a pioneer in producing viscose filament; he was Charles H. Stern. Sir J. W. Swann invited Stern and a Glasgow man named Topham to provide filaments for electric light bulbs. Stern and Topham entered into a partnership and in 1895 they produced the first viscose filament. Although they were mainly interested in electric light filament, Topham, after many experiments, by the aid of a blacking tin and an old sewing machine treadle, produced viscose thread. The importance of Topham's discovery was realised by Courtaulds, who bought the English rights, and thus the artificial silk industry came into being.

It was not until 1909 that this process became a success, and since then it had made history. In 1909 viscose products amounted to £150,000. Last year artificial silk products were valued at £124,000,000.

The Sir John Cass Technical Institute

Mr. W. A. S. Calder Speaks at the Inaugural Ceremony for the 1936-37 Session

THE courses of instruction in chemical engineering at the Sir John Cass Technical Institute were inaugurated on October 6 by an address on "The Profession of Chemical Engineering" delivered by Mr. W. A. S. Calder, F.I.C., M.I.Chem.E., past president of the Institution of Chemical Engineers, and past president of the Society of Chemical Industry.

Dr. H. Levinstein, M.Sc., Ph.D., F.I.C., president of the Institution of Chemical Engineers, who occupied the chair, said that for this country the value of the profession of chemical engineering could not be overrated. This country, he said, has passed through dangerous times during which it has been necessary for those within its borders to use every physical and mental faculty and to apply knowledge acquired by practical experience in defending themselves and the homeland in the difficulties and trials imposed upon them. The present period is no less troublous and dangerous and no one knows to-day what may happen in a world so ill-balanced, so full of trouble, misery and discontent.

Importance of Chemical Engineering

Chemical engineering is one of those dual occupations which is as important in times of national crises as in times of peace and prosperity. It is for this reason that chemical engineering is one of the most important professions for use in the world as it is to-day. The Institution of Chemical Engineers is comparatively young, but in the years in which it has been in existence it has created a standing equal to that of most of the older engineering institutions.

In referring to Mr. Calder, Dr. Levinstein said that he could not conceive anybody more suitable to give an opening lecture in a new branch of teaching such as that now being provided at the Sir John Cass Technical Institute. There is no one better known among chemical engineers and chemists who stands for all that is progressive and best in the profession, more especially in the art of the science and practice of running a large chemical undertaking.

Dr. Levinstein concluded by saying that he had some personal acquaintance with the Institute and was glad to know that the most recent development of its work was the establishment of chemical engineering courses which were now being inaugurated.

Contributions of Great Men

Chemical engineering, said Mr. Calder in his presidential address, is one of our most modern professions, already so successful in meeting the needs of mankind as to make it impossible to set any limitations on its achievements in the future. These truly inspired words were actually uttered by the Duke of Kent at the opening of the First International Chemical Engineering Congress in London last June.

What great men have, even in our own time, bequeathed a rich heritage to the profession, Beilby, Duckham, Hinchley, Mond, Threlfall, and Nathan, whose far-seeing vision was due the great congress, asked Mr. Calder. What is a chemical engineer? How do you get him? What good is he when you have got him?

Up till comparatively recently it used to be fashionable for us to say to each other: "I know what a chemist is and i know what an engineer is, but what is a chemical engineer?" On similar lines the question might be asked: "I know what a sailor is and I know what a soldier is, but what is a soldier-sailor?" In both cases the true answer is the same—"A *jolly* good fellow," and the acknowledged confidant of those anxious to tell the tale!

The present view of a considerable number of members of the Institution of Chemical Engineers, continued Mr. Calder, is that a chemical engineer is a well-blended mechanical mixture and that, for the time being, it is unwise to attempt to lay down arbitrary standards as to the exact proportion of chemist or engineer to be used. Doubtless at some future date, due to the improved facilities for imparting chemical engineering knowledge, a definite crystalline product will be obtained.

Proceeding to the second question, "How do you get him?"—in the words of the immortal Mrs. Beeton, "Take a young chemist and proceed to treat him by any of the methods set forth in the publications of all known societies and institutions." You can, of course, use an engineer for the purpose, but it is easier to catch chemists young! In connection with the training of chemical engineers it appears that there is a chance of getting in on the ground floor (as our stock-broking friends say) for students. Some of our best technical men, who steadfastly resist the syren voice of industry, are devoting themselves to this work, and the numbers of students are at present so small that each student gets an amount of personal contact with his professor, which is a privilege shared by very few other branches of learning. After all, a pound of even the best butter can only spread so many slices, and where the number of students is unduly large some unfortunates are likely to get little or no personal attention, whereas the chemical engineering student at present has an unique opportunity.

What Good is the Chemical Engineer?

Answering the third question—"What good is he when you have got him?"—we may say that the chemical engineer, owing to the nature of his training, is a man whom one should be able to rely upon for his sound "think in the middle" view of technical problems, and he should be capable of translating the test-tube experiment through the intermediate "devil's kitchen" stage up to the full sized plant. He should prove a man with a "field glass" rather than a "microscope" or "astronomical telescope" type of mind, and the wise chemical engineer is always prepared to seek eagerly the assistance both of the chemical and engineering experts on any special points with which he is concerned.

When looking for the needle in the haystack one would not expect a chemical engineer to mistake the hay for the needle, and at any rate if he did fail to find the needle he would not write a three-volume novel report dealing entirely with the subject of the hay. The amount of time saved by saying "I don't know" is incalculable, and one is inclined to have greater confidence in a man who does this than in the "walking encyclopedia."

An Experimental Service

In conclusion, Mr. Calder said he could not refrain from urging all young chemical engineers to have ever in mind the protection from accident of those who operate their plants, and for whose safety they have a grave personal responsibility. He might also emphasise that the profession is an experimental science. No tomes of reference bound in gilt morocco; no swiftly flowing stylus o'er reams of papyrus can give results such as have ensued from the broken thermometer, or from the tarry mess sticking to the side of the beaker!

Thanks were conveyed to Dr. Levinstein and Mr. Calder by Professor Lander and Dr. Sinnatt, both of whom are members of the Sir John Cass Institute's Consultative Committee.

Pensions for Imperial Chemical Industries, Employees

Scheme to Come into Operation on January 1

A WORKERS' pension scheme of far-reaching importance has just been introduced by Imperial Chemical Industries, Ltd. The scheme, which will come into operation on January 1, 1937, covers no fewer than 43,000 manual workers, and together with the existing staff and foremen's schemes completes the pension arrangements for the whole of the company's employees.

The scheme provides for retirement by right at the age of 65, but by the consent of the company at any age from 60, and the basis of the scheme is a pension of £1 per week for the average worker after 40 years' service. The company will contribute 3 per cent. of its current wage bill to the pension fund, and the workers themselves will contribute, by way of deduction from wages, at the rate of 2½ per cent. The benefits are defined in the scheme as follows:

(1) On normal retirement at the age of 65, or at such later age as may be approved in any individual case and subject to ten year's pensionable service having been completed, an annual pension payable for life, equal to one-third of the member's contributions, including those (if any) credited to him in respect of his back service.

(2) On retirement, at any date on or after attaining the age of 60, but before attaining the age of 65, on the initiative of, or with the consent of, the company, except for health reasons, and subject to ten years' pensionable service having been completed, an annual pension payable for life, equal to one-third of the member's contributions, including those (if any) credited to him in respect of his back service; in addition, a supplementary pension of 10s. per week, until the member becomes eligible for the State Old Age Pension.

(3) On retirement owing to permanent incapacity by reason of sickness before attaining the age of 65, subject to ten years' pensionable service having been completed, an annual invalidity pension equal to one-third of the member's contributions, including those (if any) credited to him in respect of his back service; in addition, a supplementary pension of 10s. per week, less State Disablement Benefit, until the member becomes eligible for the State Old Age Pension.

(4) On discharge owing to circumstances beyond the member's own control, other than failure of health after attaining the age of 50, but before attaining the age of 60, subject to minimum qualifications in regard to age and service, an annual pension payable for life, equal to one-third of the member's contributions, including those (if any) credited to him in respect of his back service.

(5) On retirement or discharge owing to circumstances beyond the member's own control, and failing to qualify for a pension, a cash payment, equal to the total of the member's contributions, including those (if any) credited to him in respect of his back service, with compound interest at the rate of 3½ per cent. per annum, and payable either at the termination of employment, or at a later date not exceeding twelve calendar months from the termination of employment.

(6) On death, while in the company's service, and being a member of the fund, a cash payment to the legal personal representative of the member, of a certain number of weeks' wages, varying with the length of service; for instance, in the case of a man with 30 years' service who had been in receipt of £3 per week, £276 would be payable; if he had 40 years' service, £486 would be payable.

(7) On death while on pension, a cash payment to the legal personal representative of the member equal to the amount (if any) by which the total of the pension payments (including supplementary pension) received by the member is less than the cash sum which would have been payable had the worker died at the date of his retirement.

(8) On leaving the service of the company for reasons within the member's own control, a cash payment equal to the total of the contributions actually paid by the member, with compound interest at the rate of 3½ per cent. per annum.

The company is making the necessary arrangements whereby full credit for their past service is being given to all present employees.

The Road and Rail Future for Fuel

Sir Philip Dawson's Presidential Address to the Institute of Fuel

IN the course of his presidential address to the Institute of Fuel, on October 15, Sir Philip Dawson, M.P., drew attention to the fact that, as by far the greater part of the some 4,000,000 tons of motor spirit and fuel oil used in this country has to be imported, it not only means that a foreign product is replacing home-produced coal, but also that in the event of war we might find it difficult to maintain supplies of oil which are essential to our existence. Germany, on the other hand, is far more alive to the situation, and is taking steps to meet it. It is estimated, for instance, that in the present year Germany would produce at home 1,235,000 of her total consumption of 2,100,000 tons of light motor fuel. Germany has also perfected a process whereby 25 lb. of sawmill refuse can be converted into a gas equal in power value to 1 gal. of petrol. The Diesel engine, moreover, has been developed more fully in Germany, but this is largely due to the fact that there is no tax, as in this country, of 8d. a gallon on oil.

Sir Philip pointed out that it was not until the early part of the 19th century that fuel was generally used as a source of motive power in transport. Then it was that the application of steam to rail traction brought about the rapid decline of horse-drawn road transport. Thus things remained until the close of the century, when, with the coming of the internal combustion engine, road transport once more became a practical proposition. The position in present times was that, while coal was still the dominant factor in rail transport, oil practically controlled road transport and was likely to become increasingly important in railway operation. Electricity also played its part, but in this country, where little water power was available, coal was likely to continue to be of importance as the application of electricity to traction only meant the consumption of fuel transferred from the travelling vehicle to the power house.

After drawing attention to the fact that our coal deposits, which were one of our greatest sources of wealth, were not being employed to their best advantage, Sir Philip outlined the progress made in recent years in the replacement of horse by mechanical transport on the roads. In 1934 there were in this country only 23,000 horse-drawn vehicles as compared with 269,000 in 1921. The number of vehicles propelled by internal combustion engines, on the other hand, had now swelled to nearly 2,500,000, and there were 5,000 others operated by storage batteries or steam. So far, there were comparatively few heavy-oil engined vehicles, but with

improved engines the numbers were likely to increase. The tax of 8d. per gallon on Diesel oil, moreover, had tended to limit the use of these vehicles to long-distance operation.

Sir Philip then went on to show how road transport was rapidly increasing to the detriment of the railways. This was largely due to the increased facilities offered by road operators. In 1931 there were only 360,314 goods vehicles on the roads, whereas last year there were 435,000. The growing importance of the road industry was shown also by the fact that in 1935 it employed 1,272,000 persons as against the 675,000 employed by the railways.

This rise of the road transport industry had resulted in the consumption of motor spirit in this country rising from 350,000 tons in 1913 to over 4,000,000 tons in 1934. As by far the greater proportion of this fuel was imported, this not only meant that home-produced coal was being displaced, but also that in the event of war, the country might be seriously embarrassed. Imperial Chemical Industries, Ltd., were doing something in the direction of producing oil from coal, but in Germany they were far more alive to the situation and it was estimated that of the 2,100,000 tons of light motor fuel likely to be consumed by Germany in 1936, 1,235,000 tons would be home-produced. Germany had also introduced legislation designed to encourage the use of home-produced fuels, including gas.

Discussing the transport of fuel by rail, Sir Philip said the quantity had been falling steadily in recent years. In 1934, the gross receipts for the transport of fuel represented 38 per cent. of the total receipts for goods traffic and 20 per cent. of the total gross receipts of the British railways from all sources. The cost of fuel consumed by the railways represented in 1934 one-third of the total locomotive costs; including fuel, this represented approximately 25 per cent. of the total operating costs. There was scope for reducing this percentage and increasing the net and gross receipts by using larger wagons, reducing empty running, reducing the time wagons stood loaded in sidings, increasing the mileage of locomotives and of train personnel without increasing their hours of service, increasing the percentage of time that locomotives were performing useful work, and decreasing the cost of maintenance of haulage units by adopting new methods of haulage.

The Oil and Colour Chemists' Association

Activities to be Extended

THE first meeting of the 1936-37 Session of the Oil and Colour Chemists' Association was held at the Palace Hotel, Bloomsbury, London, on Thursday, October 8, when the president, Dr. G. F. New, delivered his presidential address entitled "The Obects of our Association."

Dr. NEW first gave a detailed historical review of the development of the Association and the amalgamation with the already existing Paint and Varnish Society, after which he passed on to a consideration of the general industrial development and the relation of the Association to it. The chief general developments in the industrial world in recent years, he pointed out, had been the coalescing of small industrial enterprises into larger organisations, usually with the result that their commercial and technical strength was greatly enhanced. The second devolpment had been a diminution in the intensity of the secrecy complex which dominated the activities of so many industries and firms years ago. This attitude of secrecy was occasionally justified when a particular firm occupied a more or less unique position within an industry won by the expenditure of large sums of money and years of effort in research. In the majority of cases, however, secrecy—because it was mutual—entailed a tremendous waste of investigation and duplication of effort. The elimination of wasteful competition by the amalgamation of firms into larger units or, indeed, any advance towards this ideal, was worthy of considerable effort.

When a group of firms in one industry combined to form a new and larger unit, a sorting out of functions in the new organisation followed. Where six pots of varnish had been made in the past, one larger one was now manufactured, and this was usually larger than the total of the units which it replaced, because the greater economy in manufacture and selling organisation attracted business which would otherwise have gone to small competitors still in the individual state of development. Instead, therefore, of six chemists concerning themselves with varnishes, one did the work, but this did not mean that the other five were thrown out of employment. There was so much new knowledge to be acquired and put into practice in our industries that no technical man could ever be said to be redundant. The converse consequence of the rationalisation process as it affected technical staffs was that the one chemist who not only superintended varnish manufacture, pigment testing, paint formulation and manufacture, and carried out other functions in the small firm, was now able to become more of a specialist in a narrower field. The result was that the chemist was led to seek further inspiration and information regarding his more specialised field, and inevitably he developed more of a research outlook and the industry as a whole followed the same course.

Thus, on the one hand we saw the development of the Research Association movement, which was undoubtedly growing stronger year by year, and on the other hand, we found technical societies, such as the Oil and Colour Chemists' Association, playing a more and more important part in industrial life. The individual chemist was brought closer into contact with the limits of existing knowledge as his function became more specialised. He found it more and more necessary, therefore, to keep in touch with sources of the latest information regarding his profession and to take every possible opportunity of meeting his professional colleagues for mutual discussion of methods of attack on problems which all were meeting. With the universal increase in research and development activities, advance in knowledge and technique were becoming more and more rapid. Moreover, the news of such advance was spread over the surface of the globe in extremely short times and, for instance, a synthetic resin which might be discovered in one country to-day was probably on the market all over the world within six months, if it had an advantage over existing products.

At the present time, new ingredients, new processes, and new fundamental procedures in construction were born at an ever increasing rate, and the news of their birth spread round the world in a few hours. It was vitally important, therefore, to manufacturers in any industry and in the paint, varnish and colour industries in particular that their scientific staffs should have access to the latest and fullest records of progress and that they should be able to meet their fellows for formal and informal discussions at frequent intervals. The Oil and Colour Chemists' Association existed to satisfy these requirements and he (Dr. New) suggested it would be an excellent investment on the part of all firms in these industries to pay the subscriptions to the Association for the whole of their technical staff and to give them encouragement and facility to attend the meetings of the nearest section. He stressed the importance of the whole of the technical staff, for it was not only the chemist who was located in the research laboratory who could benefit from the Association.

Urging greater attention by the Association to matters other

than research, Dr. New suggested that more adequate attention should be given to accounts of progress on the works or manufacturing side, and said he would like to see and hear contributions from this wider field of activities which the members of the Association were undertaking. There was a considerable growth of interest in the technical side on the part of non-technically trained staffs. Under this heading came all scientifically minded heads of businesses, departmental managers, etc., who felt the need for closer acquaintance and more intimate contact with the technical development of their enterprises. Such men should be encouraged to become members and the widening of the membership in that way would, he hoped, justify the formation of a technical section as well as the more purely chemical section. This technical section might deliberate on production problems, costing and the craftsman aspect as opposed to the chemical aspect.

More Provincial Sections

Dr. New went on to recommend the formation of further provincial sections of the Association, the appointment of a full-time secretary (when funds permitted), active participation as a body in research, greater interest in the younger members of the industry by the formation of junior sections, and, finally, the holding of an annual two-days' conference of the Association, the first of which he hoped it would be possible to arrange in the spring of 1937.

There was a short discussion on this presidential address and the participants were generally in agreement with the views expressed. Dr. J. J. Fox, the Government chemist, sent a letter in which he specially welcomed the suggestion of meetings dealing with the commercial and operative sides of the industry.

Oil Prospecting in England

Anglo-American Reciprocity

THE Secretary for Mines makes the following announcement with regard to discussions which have recently taken place between the British and United States Governments on the subject of reciprocity between Great Britain and the United States under the provisions of the United States Mineral Leasing Act and the British Petroleum (Production) Act and Regulations:—

The Petroleum (Production) Regulations, 1935, made under Section 6 of the Petroleum (Production) Act, 1934, provide, *inter alia*, that in the case of aliens or foreign-controlled companies desiring to search and bore for oil in this country, a licence may only be held by nationals of those countries the laws and customs of which afford comparable rights to British nationals. Similarly, the United States Mineral Leasing Act of 1920, which governs the grant of oil leases on federal lands, contains a proviso that citizens of another country, the laws, customs or regulations of which deny similar or like privileges to citizens or corporations of the United States, shall not own any interest in any lease acquired under the provisions of that Act.

As a result of the exchange of views which has taken place, the United States Government has been informed that the British Petroleum (Production) Act, 1934, and the Petroleum (Production) Regulations, 1935, are so construed and applied as to permit of the participation by American citizens and corporations in oil prospecting and development in Great Britain, and the United States Government have informed H.M. Government that Great Britain is recognised as a reciprocal country under the Mineral Leasing Act, 1920.

A prospecting licence under the Petroleum (Production) Act, 1934, and the Petroleum (Production) Regulations, 1935, has been issued by the Board of Trade to Major C. A. Pogson and Mr. E. H. Cunningham-Craig, carrying on business in partnership as the Midlothian Petroleum Syndicate at "Wanowri," Barrowfield Drive, Hove. The licence covers approximately 12 square miles in the county of Midlothian.

Tank Explosion at Saltend

Recommendations of Government Inspector

THE report of the inquiry held by Mr. H. E. Watts, H.M. Inspector of Explosives, into the accident on April 16, at the premises of the Anglo-American Oil Co., Ltd., at Saltend, Hull, in which three men lost their lives, has now been issued. The report states that "the question of the biological production of iron sulphide and possibly phosphoretted hydrogen in petroleum tanks, and the conditions required to bring about spontaneous ignition by this means, should be investigated." It is added that "in petroleum spirit depôts, all operations such as welding, etc., which involve the use of apparatus capable of igniting an inflammable atmosphere, should be under the control of a responsible person."

H.M Inspector of Explosives concurs with the verdict of the jury at the inquest that "the cause of death in each case was due to shock following multiple injuries caused by the accidental explosion of the tank. They added that "they thought that the gas got into the tank by compressed air being pumped through the petrol pipe, but they were not satisfied as to how the gas was ignited." They recommended "a separate air pipe, better supervision of the welding set, and that the theory of the inspector, of ignition where sea water is used, be inquired into."

Society of Public Analysts

Election of New Members

AN ordinary meeting of the Society of Public Analysts was held on October 7 at the Chemical Society's Rooms, Burlington House, the president, Dr. G. Roche Lynch, in the chair. Certificates were read in favour of James H. Barker, George B. Brook, K. L. Budhiraja, Marjorie B. Carter, Romolo de Giacomi, Norman A. Hurt, John W. Pooley, William J. Stringer and Arnold Woodmansey.

The following were elected members of the Society: John Glover, Arthur. St. G. J. McC. Huggett, Frank E. A. Leibbrandt, John H. Seager and Alfred P. Telford.

Further investigations into the analytical chemistry of tantalum, niobium and their mineral associates was reported by W. R. Schoeller, Ph.D., F.I.C., who gave a general summary of the work embodied in the thirty-two sections previously published. He dealt with the quantitative separation of tantalum and niobium by methods which are also of importance in other branches of analytical chemistry, and the analysis of earth-acid minerals by the tartaric acid method.

The determination of betaine in sugar beet by-products was the subject of a paper by J. W. Blood, A.I.C., and H. T. Cranfield. Betaine in sugar beet by-products—molasses and molassed beet pulp—may be determined by removing proteins with basic lead acetate, reducing trimethylamine oxide to base by means of a zinc-copper couple, boiling off all volatile bases, and finally precipitating the betaine as a periodide in alcohol by means of iodine solution. The periodide is dissolved in alcohol, and the solution is titrated with sodium thiosulphate. If the sugar content exceeds 2 per cent. the sugar must be removed by treating the concentrated solution with sulphuric acid, lixivating the charred mass with water, and determining the betaine in the filtrate.

Discussing the determination of zinc in foods, N. D. Sylvester, M.Sc., A.I.C., and E. B. Hughes, D.Sc., F.I.C., said that zinc is extracted from the ash of food by means of diphenylthiocarbazone, which effects its separation from most of the other common metals. A micro-method of titration of the separated zinc with potassium ferrocyanide solution was described, the titration being effected in acetic acid solution with diphenylbenzidine and potassium ferricyanide as internal indicators. Another micro-method was described in which the iodine liberated from potassium iodide in the presence of potassium ferricyanide is titrated with sodium thiosulphate solution.

British Overseas Chemical Trade in September

According to the Board of Trade returns for the month ended September 30, 1936, exports of chemicals, drugs, dyes and colours were valued at £1,736,888, as compared with £1,677,807 for the corresponding month of 1935, showing an increase of £59,081. Imports were valued at £1,190,251, as compared with £1,028,106 an increase of £162,145. Re-exports were valued at £44,874.

Imports

	Quantities. September 30, 1935.	Quantities. September 30, 1936.	Value. September 30, 1935.	Value. September 30, 1936.
Acids—				
Acetic .. .. cwt.	7,085	11,625	10,637	13,597
Boric (boracic) .. ,,	2,940	2,902	3,085	3,020
Citric .. .. ,,	1,023	872	4,089	3,467
Tartaric .. .. ,,	1,829	1,727	7,746	7,268
All other sorts .. value	—	—	6,560	7,330
Borax .. .. cwt.	10,420	15,200	5,396	8,592
Calcium carbide .. ,,	71,046	87,881	39,744	49,566
Fertilisers, manufactured				
Superphosphate of lime ton	—	380	—	699
All other descriptions ton	3,903	3,220	13,878	14,427
Phosphorus .. cwt.	2,132	22	7,307	82
Potassium compounds—				
Caustic and lyes ,,	9,321	11,139	10,809	12,973
Chloride (muriate) ,,	281,862	422,884	90,723	134,192
Kainite and other mineral fertiliser salts ,,	294,948	324,120	55,278	63,727
Nitrate (saltpetre) ,,	46,704	8,037	17,078	5,971
Sulphate .. ,,	209,378	251,672	86,021	108,867
All other compounds ,,	8,500	8,033	11,897	12,147
Sodium compounds—				
Carbonate, including crystals, ash and bicarbonate .. cwt.	—	368	4	319
Chromate and bichromate .. .. cwt.	12,647	1,407	17,050	1,583
Cyanide .. .. ,,	2,701	4,503	6,466	10,347
Nitrate .. .. ,,	43,893	39,916	8,825	8,463
All other compounds ,,	17,486	19,587	13,876	15,899
Other chemical manufacturers .. value	—	—	220,268	268,382
Drugs, medicines, etc.				
Quinine and quinine salts .. .. oz.	96,196	140,717	8,934	10,160
Medicinal oils .. cwt.	3,142	2,344	17,666	5,581
Proprietary medicines value	—	—	51,223	46,522
All other sorts .. ,,	—	—	47,138	64,993
Dyes and dyestuffs and extracts for tanning—				
Finished dyestuffs from coal tar .. cwt.	2,492	3,635	73,749	109,054
Extracts for dyeing ,,	3,913	4,791	8,174	8,007
Extracts for Tanning (solid or liquid)—				
Chestnut .. cwt.	34,542	27,458	22,914	18,476
Quebracho .. ,,	16,431	15,941	11,799	13,633
All other sorts ,,	42,732	18,398	29,878	13,263
All other dyes and dyestuffs .. .. cwt.	744	643	14,612	13,062
Painters' colours and materials—				
White lead (basic carbonate) .. cwt.	7,082	5,186	8,540	7,088
Lithopone .. ,,	17,006	24,803	11,357	16,592
Ochres and earth colours cwt.	28,314	45,513	10,252	17,575
Bronze powders ,,	1,758	1,922	12,184	12,500
Carbon blacks .. ,,	21,980	30,232	32,716	43,361
Other pigments and extenders, dry .. cwt.	29,437	48,648	9,587	12,184
All other description ,,	11,916	12,420	20,646	27,282
Group .. .. value	—	—	1,028,106	1,190,251

Exports

Acids—				
Citric .. .. cwt.	2,275	2,045	9,982	8,355
All other sorts .. value	—	—	21,339	20,797
Aluminium compounds ton	1,753	1,874	19,668	8,038
Ammonium compounds—				
Sulphate .. ton	16,244	16,053	95,234	96,853
All other sorts .. ton	864	5,271	11,098	50,179
Bleaching powder (chloride of lime) .. .. cwt.	53,512	55,213	14,458	14,261
Coal tar products—				
Cresylic acid .. gal.	125,870	149,535	10,744	19,461
Tar oil, creosote oil, anthracene oil gal.	3,496,597	2,808,804	83,268	63,637
All other sorts .. value	—	—	23,609	25,267
Copper, sulphate of ton	566	1,874	8,117	26,899
Disinfectants, insecticides, weed killers .. cwt.	35,243	35,288	76,991	75,330
Fertilisers, manufactured ton	15,557	15,593	63,829	52,753
Glycerine .. .. cwt.	11,336	12,963	27,848	32,773
Lead compounds .. ,,	13,269	12,897	16,737	17,610
Magnesium compounds ton	411	378	9,754	9,486
Potassium compounds cwt.	4,127	5,766	11,843	9,149
Salt (sodium chloride) ton	22,232	22,952	57,683	60,383
Sodium compounds—				
Carbonate, including crystals, ash and bicarbonate .. cwt.	315,164	285,553	76,097	66,623
Caustic .. .. cwt.	188,081	169,064	94,408	77,005
Nitrate .. .. ,,	24,157	8,211	8,491	2,678
Sulphate, including salt-cake .. .. cwt.	61,210	85,891	5,242	7,539
All other sorts .. ,,	67,912	71,842	86,783	73,411
Zinc oxide .. .. ton	1,224	1,041	21,908	18,731
All other descriptions value	—	—	213,908	194,795
Drugs, medicines, etc.—				
Quinine and quinine salts .. .. oz.	75,500	288,449	9,689	27,471
Proprietary medicines value	—	—	92,755	109,049
All other descriptions ,,	—	—	139,034	138,716
Dyes and dyestuffs and extracts for tanning—				
Finished dyestuffs from coal tar—				
Alizarine, alizarine red and indigo (synthetic) .. cwt.	1,604	1,602	8,255	11,222
Other sorts .. ,,	5,839	6,290	74,743	89,160
All other descriptions ,,	12,518	22,213	20,952	24,705
Painters' colours and materials—				
Pigments and extenders, dry—				
Ochres and earth colours cwt.	15,669	14,753	15,025	14,376
Other descriptions ,,	23,098	26,787	29,698	32,615
White lead .. ,,	5,700	5,823	11,571	11,716
Paints and painters' enamels prepared cwt.	33,327	47,161	88,382	123,533
Varnish and lacquer (clear) .. .. gal.	70,214	81,813	25,927	32,213
Printers' ink .. cwt.	3,429	3,944	23,667	22,473
All other descriptions ,,	35,186	34,986	69,070	67,626
Total .. .. value	—	—	1,677,807	1,736,888

Re-Exports

Chemical manufacturers and products .. value	—	—	19,624	18,955
Drugs, medicines and medicinal preparations value	—	—	9,913	10,036
Dyes and dyestuffs and extracts for tanning cwt.	592	1,193	1,367	8,619
Painters' colours and materials .. .. cwt.	672	1,078	1,982	7,264
Total .. .. value	—	—	32,886	44,874

Testing Materials

International Association's London Conference

FOR those interested in concrete, natural stones and ceramic materials the congress of the International Association for Testing Materials, which is to be held in London in April next, will be of considerable importance. The subjects to be discussed are divided into four groups, A (metals), B (inorganic materials), C (organic materials) and D (subjects of general importance), each of which is presided over by a distinguished worker from overseas. Group B, which covers concrete, natural stones and ceramic materials, has Professor E. Suenson, of Denmark, as president, and an inspection of the preliminary list of papers which are to be presented indicates that the treatment of the different subjects will be comprehensive, as the papers originate in some eleven different countries.

Amongst the subjects included under "concrete" are the testing of aluminous cement and plastic mortars, the development of heat by cement, sea-water cements, waterproofing compounds, the creep of concrete under load, vibrated concrete, cement pipes and the strength of reinforced concrete beams. Natural stones are to be discussed in Austrian, German and British papers, whilst under ceramic materials the general testing of ceramic materials, the strength and testing of bricks and tiles, refractories, electrical porcelain and the classification of clays will receive notice.

The last congress was held in 1931 and every effort is being made to ensure that the knowledge in this important field will be brought completely up to date. The papers will be presented in the form of summaries so that a vast amount of information will be made available in easily accessible form.

Personal Notes

MR. ALEXANDER MUIR, distiller, late of Dunsmuir, Ladywell Road, Corstorphine, Edinburgh, left net estate valued at £221,636.

MR. WILLIAM SOMERVILLE, for many years the proprietor of the glue works at Whinnie Row, Bonnyrigg, Mid-Lothian, has died in his 91st year.

SIR FREDERICK L. MACLEOD, who retired in 1930 from the control of R. and J. Garroway, chemical manufacturers, Glasgow, died in Glasgow on October 11. Sir Frederick was a director of the Egyptian Phosphate Co.

MR. PERCY EDGE, manager since 1918 of Ainsworth's Bleachworks, Bolton, Lancashire, who has recently retired, has been presented with a gold watch by Mr. Thwaites, a director of the Bleachers' Association, Ltd., of which the Halliwell, Bolton, works have been a branch for many years.

MR. E. WALLACE was re-elected chairman of the Association of British Chemical Manufacturers for the ensuing year at the council meeting immediately following the annual meeting on October 8. Mr. N. N. Holden was re-elected vice-chairman, and Mr. C. F. Merriam, hon. treasurer.

MR. W L. PULLAR, managing director of Robert Pullar and Sons, Ltd., dyers and bleachers, Keirfield Works, Bridge of Allan, and Ashfield Works, Dunblane, was presented with a silver tea service and tray, suitably inscribed, at a gathering in the Royal Hotel, Bridge of Allan, on October 10, to mark his retirement from the business, with which he has been associated for 41 years. The gift was handed over by Mr. Thomas Blatherwick, head of the company's Manchester branch, who paid a warm tribute to the part Mr. Pullar had played in developing the Continental business of the company. Mr. J. Lindsay Pullar, managing director, presided.

Foreign Chemical Notes

Iceland

EXTENSIVE DEPOSITS OF PUMICE in the volcanic region of Arnarstapi are to be exploited, and a special road to the coast will be built to facilitate exportation.

France

COMPANIES RECENTLY REGISTERED include:—Société Effina, 11 rue Jasmin, Paris (16), with a capital of 100,000 francs (import and export of waxes, resins and tars); La Vulite, 50 rue de Sèvres, Boulogne-Billancourt (Seine), with a capital of 150,000 francs (cellulose laquers).

Germany

BROMIDE OXIDE (Br_2O) is extremely unstable, rapidly decomposing on exposure to light. Brenschadt and Schumacher now claim to have isolated the compound following action of bromine upon a carbon tetrachloride solution of mercuric oxide.

Finland

COMPLETE SUCCESS HAS ATTENDED large-scale tests, extending over several years, of the efficacy of calcium chloride as a dust-preventative on highways. The length of road treated increased from 40 miles in 1934 to 125 miles in 1935, while it is planned to treat over 300 miles in the present year. This will necessitate importation of 1,500 tons of calcium chloride.

Norway

ACCORDING TO THE PATENTED PROCESS of the Moss Glawaesk Co., of Moss, caustic soda is made from sodium chloride by heating to a temperature of about 1,000° C. in admixture with silica and boric or phosphoric acid. A 10 per cent. aqueous solution of the reaction product is treated with chalk in quantity sufficient to precipitate the impurities as calcium salts.

Toxic Gases in Industry

Practical Tests

REFERENCE has been made from time to time during the past year to a series of tests which has been worked out on behalf of the Home Office and the Association of British Chemical Manufacturers for the detection of low concentrations of dangerous gases in industry. The first of these tests, dealing with hydrogen sulphide, will shortly be published by the Department of Scientific and Industrial Research, through H.M. Stationery Office. The complete series of tests will comprise the following gases and vapours: Aniline, arsine, benzene, carbon bisulphide, carbon monoxide, chlorine, hydrogen cyanide, hydrogen sulphide, nitrous fumes, organic halogen compounds, phosgene and sulphur dioxide.

In most cases, chemical methods involving colour changes have been adopted, and charts of standard stains have been prepared as part of the test. Each test has been carefully standardised in the laboratory and tested under practical conditions in the actual works, and has been made as simple and straightforward as possible.

The tests have already been brought to the notice of the members of various scientific bodies and of the associations operated from 166 Piccadilly, and were described by Mr. J. Davidson Pratt in a recent lecture to the Institute of Chemistry. The cost of the pamphlets will be partly dependent upon the text, but it is estimated that they will cost between 5s. and 6s. per copy complete with one set of stains, and that spare charts of the standard stains, where required, will cost between 1s. and 3s. each. The cost of No. 1 of the series, viz., hydrogen sulphide, for instance, will be 3s. 6d. for the pamphlet, plus 2s. for the chart of stains, giving 5s. 6d. in all. Copies of the test will be obtainable from H.M. Stationery Office, or through any bookseller.

Weekly Prices of British Chemical Products

THERE are no price changes to report in the markets for rubber chemicals, wood distillation products, coal tar products, perfumery chemicals, essential oils and intermediates. In the pharmaceutical section there have been reductions in the prices of citrates (4d. per lb. less for potassium citrate and sodium citrate and 3d. per lb. less for iron ammonium citrate). Among heavy chemicals, soda ash has been reduced by 10s. per ton, and sodium sulphite, pea crystal, has been reduced by 5s. per ton. Unless otherwise stated the prices below cover fair quantities net and naked at sellers' works.

Price Changes

General Chemicals.—SODA ASH, 58°, spot, £5 2s. 6d. per ton; SODIUM SULPHITE, pea crystal, spot, £13 5s. per ton.

Pharmaceutical Chemicals.—POTASSIUM CITRATE, B.P., 1s. 5d. to 2s. per lb.; SODIUM CITRATE, B.P., 1s. 6d. to 2s. 1d.; IRON AMMONIUM CITRATE, B.P., 1s. 9d. to 2s. 4d.

MANCHESTER.—Business in both heavy and light chemicals on the Manchester market during the greater part of the past year has been more extensively on a contract basis than was the experience previously, and consequently the volume of buying for prompt and near delivery positions has tended to be on a correspondingly small scale. This week has witnessed a steady movement of supplies into consumption in the Lancashire district, including textiles, paper-making and the leather industries, and quotations for the most part are on a firm basis. In the case of the by-products section the position of pitch is still an uncertain factor, but in pretty well all other directions prices keep up and a fair amount of business has been reported here during the past week, with cresylic acid and one or two other lines in short supply.

GLASGOW.—There has been an improved demand for chemicals for home trade during the week, though export business remains very limited. Prices generally continue steady at about previous figures, with no important changes to report. In the coal tar products group, fresh quotations for carbolic acid 60's crude and distilled are firmer round 2s. 6d. to 2s. 9d. and 2s. 9d. to 3s. 3d. respectively. Competition is keen for these grades. Available lots of cresylic acid 97/99 are also well sought after. Benzole and naphthas maintain their values although present movements are largely against previous contract. There has been a moderate demand for oil fractions to special specifications, but standard creosote and washed oils on the whole are easy. Among manufacturers uneasiness is felt in some quarters about pitch stocks, and some fresh inquiries for export would be welcomed.

General Chemicals

ACETONE.—£62 to £65 per ton; SCOTLAND: £64 to £65 ex wharf, according to quantity.

ACID, ACETIC.—Tech., 80%, £30 5s. to £32 5s. per ton; pure 80%, £32 5s. to £34 5s.; tech., 40%, £16 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £32 5s.; tech., 80%, £30 5s., d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ACID, BORIC.—Commercial granulated, £27 per ton; crystal, £28; powdered, £29; extra finely powdered, £31; packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. B.P. cryst., £36; B.P. powder, £37. SCOTLAND: Crystals, in 1 cwt. bags, £28; powdered, in 1 cwt. bags, £29.

ACID, CHROMIC.—Flaked, 10d. per lb., less 2½%; ground, 10½d. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—1s. per lb. MANCHESTER: 11¾d. to 1s. SCOTLAND: B.P. crystals, 11¾d. to 1s. per lb., less 5%.

ACID, CRESYLIC.—97/99%, 3s. to 3s. 1d. per gal.; pale, 98%, 3s. 1d. to 3s. 2d.; dark, 2s. 6d. to 2s. 7d.; 99/100%, refined, 3s. 4d. to 3s. 6d. per gal. MANCHESTER: 99/100%, pale, 3s. 7d.

ACID, FORMIC.—85%, in carboys, ton lots, £42 to £47 per ton.

ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50: pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works. SCOTLAND: 80°, £24 ex station full truck loads.

ACID, OXALIC.—£48 15s. to £57 10s. per ton, according to packages and position. SCOTLAND: £2 10s. per cwt. in casks. MANCHESTER: £49 to £54 10s. per ton ex store.

ACID, SULPHURIC.—SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—1s. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. SCOTLAND: 11¾d. less 5%. MANCHESTER: 1s. per lb.

ALUM.—SCOTLAND: Ground, £10 2s. 6d. per ton; lump, £9 12s. 6d.

ALUMINA SULPHATE.—LONDON: £7 10s. to £8 per ton. SCOTLAND: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £30 per ton; powdered, £33, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—LONDON: Fine white crystals, £18 to £19. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM SULPHATE.—Neutral quality, 20.6% nitrogen, £7 5s. per ton.

ANTIMONY OXIDE.—SCOTLAND: £61 to £65 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 1d. per lb.; crimson, 1s. 5½d. to 1s. 7d. per lb., according to quality.

ARSENIC.—LONDON: £13 10s. per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £17 10s. ex store. MANCHESTER: White powdered Cornish £19 ex store.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARIUM CHLORIDE.—LONDON: £10 10s. per ton. SCOTLAND: £11.

BARYTES.—£6 10s. to £8 per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.a. London.

BLEACHING POWDER.—Spot, 35/37%. £7 19s. per ton in casks, special terms for contracts. SCOTLAND: £9.

BORAX COMMERCIAL.—Granulated, £14 10s. per ton; crystal £15 10s.; powdered, £16; finely powdered, £17; packed in 1-cwt. bags, carriage paid home to buyer's premises within the United Kingdom in 1-ton lots. SCOTLAND: Granulated, £14 10s. per ton in 1 cwt. bags, carriage paid.

CADMIUM SULPHIDE.—3s. 11d. to 4s. per lb.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums. SCOTLAND: £5 10s. per ton net ex store.

CARBON BISULPHIDE.—£31 to £33 per ton, drums extra.

CARBON BLACK.—3¾d. to 4¾d. per lb. LONDON: 4½d. to 5d.

CARBON TETRACHLORIDE.—SCOTLAND: £41 to £43 per ton, drums extra.

CHROMIUM OXIDE.—10½d. per lb., according to quantity d/d U.K.; green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 2½d. per lb.; liquor, £19 10s. per ton d/d

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.

CREAM OF TARTAR.—£3 19s. per cwt. less 2½%. LONDON: £3 17s. per cwt. SCOTLAND: £3 18s. net.

DINITROTOLUENE.—66/68° C., 9d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON: £24 10s. per ton. SCOTLAND: 40%, £25 to £28 ex store.

IODINE.—Resublimed B.P., 5s. 1d. per lb.

LAMPBLACK.—£23 to £24 per ton.

LEAD ACETATE.—LONDON: White, £33 15s. per ton; brown, £1 per ton less. SCOTLAND: White crystals, £34 to £35; brown, £1 per ton less. MANCHESTER: White, £35, brown, £33 10s.

LEAD NITRATE.—£32 10s. to £34 10s. per ton.

LEAD, RED.—SCOTLAND: £32 10s. per ton less 2½%, carriage paid, for 2-ton lots.

LEAD, WHITE.—SCOTLAND: £40 per ton, carriage paid. LONDON: **£41.**

LITHOPONE.—30%, £16 to £16 5s. per ton.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £6 17s. 6d. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 per ton, ex wharf.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

PARAFFIN WAX.—SCOTLAND: 3⅝d. per lb.

PHENOL.—6⅜d. to 7¼d. per lb.

POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £39.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. less 5%, d/d U.K. Ground, 5¼d. LONDON: 5d. per lb. less 5%, with discounts for contracts. SCOTLAND: 5d. per lb. less 5% carriage paid. MANCHESTER: 5d.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 4¼d. per lb. MANCHESTER: £39 per ton.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM IODIDE.—B.P. 4s. 3d. per lb.

POTASSIUM NITRATE.—SCOTLAND: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 8¼d. per lb. SCOTLAND: B.P. Crystals 8¾d. MANCHESTER: B.P. 10½d. to 11½d.

Potassium Prussiate.—London: Yellow, 7½d. to 8d. per lb. Scotland: 7½d. net, ex store. Manchester: Yellow, 7½d.

Salammoniac.—First lump spot, £41 17s. 6d. per ton d/d in barrels. Scotland: Large crystals, in casks, £36.

Soda Ash.—58% spot, £5 2s. 6d. per ton f.o.r. in bags.

Soda, Caustic.—Solid, 76/77° spot, £13 17s. 6d. per ton d/d station. Scotland: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 12s. 6d. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. Manchester: £13 5s. to £14 contracts.

Soda Crystals.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

Sodium Acetate.—London: £21 per ton. Scotland: £17 15s. per ton net ex store.

Sodium Bicarbonate.—Refined spot, £10 10s. per ton d/d station in bags. Scotland: £12 10s. per ton in 1 cwt. kegs, £10 15s. per ton in 2 cwt. bags. Manchester: £10 10s.

Sodium Bichromate.—Crystals cake and powder 4d. per lb. net d/d U.K. discount 5%. Anhydrous, 5d. per lb. London: 4d. per lb. less 5% for spot lots and 4d. per lb. with discounts for contract quantities. Manchester: 4d. per lb. Scotland: 4d., less 5% carriage paid.

Sodium Bisulphite Powder.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

Sodium Carbonate, Monohydrate.—£15 per ton d/d in minimum ton lots in 2 cwt. free bags. Soda crystals, Scotland: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality, 7s. 6d. per ton extra. Light Soda Ash, £7 ex quay, min. 4-ton lots with reductions for contracts.

Sodium Chlorate.—£29 per ton. Scotland: £1 10s. per cwt.

Sodium Chromate.—4d. per lb. d/d U.K.

Sodium Hyposulphite.—Scotland: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £14 10s. ex station, 4-ton lots. Manchester: Commercial, £10 5s.; photographic, £14 10s.

Sodium Iodide.—B.P., 6s. per lb.

Sodium Metasilicate.—£14 per ton, d/d U.K. in cwt. bags.

Sodium Nitrite.—London: Spot, £18 5s. to £20 5s. per ton d/d station in drums.

Sodium Perborate.—10%, 9½d. per lb. d/d in 1-cwt. drums. London: 10d. per lb.

Sodium Phosphate.—£13 per ton.

Sodium Prussiate.—London: 5d. to 5½d. per lb. Scotland: 5d. to 5¾d. ex store. Manchester: 4½d. to 4¾d.

Sodium Silicate.—140° Tw. Spot, £8 per ton. Scotland: £8 10s.

Sodium Sulphate (Glauber Salts).—£4 2s. 6d. per ton d/d Scotland: English material, £3 15s.

Sodium Sulphate (Salt Cake).—Unground spot, £3 12s. 6d. per ton d/d station in bulk. Scotland: Ground quality, £3 5s. per ton d/d. Manchester: £3 2s. 6d. to £3 5s.

Sodium Sulphide.—Solid 60/62% Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. Scotland: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 7s. 6d., d/d buyer's works on contract, min. 4-ton lots. Spot solid, 5s. per ton extra. Crystals, 2s. 6d. per ton extra. Manchester: Concentrated solid, 60/62%, £11; commercial, £8.

Sodium Sulphite.—Pea crystals, spot, £13 5s. per ton d/d station in kegs. Commercial spot, £8 15s. d/d station in bags.

Sulphate of Copper.—Manchester: £15 per ton f.o.b. Scotland: £16 10s. per ton less 5%.

Sulphur.—£9 to £9 5s. per ton. Scotland: £8 to £9.

Sulphur Chloride.—5d. to 7d. per lb., according to quality.

Sulphur Precip.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

Vermilion.—Pale or deep, 5s. 1d. per lb. in 1-cwt. lots.

Zinc Chloride.—Scotland: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

Zinc Sulphate.—London: £12 per ton. Scotland: £10 10s.

Zinc Sulphide.—10d. to 11d. per lb.

Nitrogen Fertilisers

Sulphate of Ammonia.—October, £6 17s. 6d. per ton; November, £6 19s.; December, £7 0s. 6d. for neutral quality basis 20.6% nitrogen delivered in 6-ton lots to farmer's nearest station.

Calcium Cyanamide.—October, £6 17s. 6d. per ton; November, £6 18s. 9d.; December, £7; carriage paid to any railway station in Great Britain in lots of 4 tons and over.

Nitro-Chalk.—£7 5s. per ton to end of June, 1937.

Nitrate of Soda.—£7 12s. 6d. per ton to end of June, 1937.

Concentrated Complete and Ammonium Phosphate Fertilisers £10 12s. to £11 1s. per ton, according to specification. N.P. fertilisers £10 5s. to £13 15s. per ton for minimum 6-ton lots delivered buyer's nearest station.

Coal Tar Products

Acid, Cresylic.—97/99%, 3s. 1d. to 3s. 2d. per gal.; 99/100%, 3s. 6d. to 4s. per gal., according to specification; pale 98%, 3s. 2d. to 3s. 3d.; dark, 2s. 9d. to 2s. 10d. Glasgow: Pale, 99/100%, 3s. to 3s. 6d. per gal.; pale, 97/99%, 2s. 6d. to 2s. 9d.; dark, 97/99%, 2s. 5d. to 2s. 8d.; high boiling acids, 1s. 8d. to 2s.; American specification, 2s. 9d. to 3s.

Acid, Carbolic.—Crystals, 6¾d. to 7½d. per lb.; crude, 60's, 2s. 5d. to 2s. 6d. per gal. Manchester: Crystals, 6½d. to 6¾d. per lb.; crude, 2s. 8d. per gal. Glasgow: Crude, 60's, 2s. 6d. to 2s. 9d. per gal.; distilled, 60's, 2s. 9d. to 3s. 3d.

Benzol.—At works, crude, 8½d. to 9d. per gal.; standard motor 1s. 2d. to 1s. 2½d.; 90%, 1s. 3d. to 1s. 3½d.; pure, 1s. 7d. to 1s. 7½d. London: Motor, 1s. 3½d. Glasgow: Crude, 9d. to 10d. per gal.; motor, 1s. 2d. to 1s. 3d.

Creosote.—B.S.I. Specification standard, 5½d. per gal. f.o.r. Home, 3¾d. d/d. London: 4½d. f.o.r. North: 5d. London. Manchester: 4¾d. to 5½d. Glasgow: B.S.I. Specification, 5½d. to 5¾d. per gal.; washed oil, 4¼d. to 4¾d.; lower sp. gr. oils, 4¾d. to 5d.

Naphtha.—Solvent, 90/100%, 1s. 5½d. to 1s. 6½d. per gal.; 95/160%, 1s. 7d.; 90%, 1s. to 1s. 2d. London: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. Glasgow: Crude, 5½d. to 6d. per gal.; 90% 160, 1s. 4d. to 1s. 5d.; 90% 190, 1s. to 1s. 1d.

Naphthalene.—Crude, whizzed or hot pressed, £12 to £13 per ton; purified crystals, £22 10s. per ton in 2-cwt. bags. London: Fire lighter quality, £5 to £5 10s. per ton; crystals, £27 to £27 10s. Glasgow: Fire lighter, crude, £7 to £8 per ton (bags free).

Pyridine.—90/140%, 6s. to 9s. per gal.; 90/180, 2s. 3d. Glasgow: 90% 140, 6s. to 6s. 6d. per gal.; 90% 160, 5s. to 5s. 6d.; 90% 180, 2s. 6d.

Toluol.—90%, 1s. 11d. per gal.; pure, 2s. 3d. Glasgow: 90% 120, 1s. 10d. to 1s. 11d. per gal.

Pitch.—Medium, soft, 35s. per ton, in bulk at makers' works. Manchester: 32s. 6d. f.o.b., East Coast. Glasgow: f.o.b. Glasgow, 30s. to 35s. per ton; in bulk for home trade, 32s. 6d.

Wood Distillation Products

Acetate of Lime.—Brown, £8 10s. to £9 per ton; grey, £10 10s. to £11. Liquor, brown, 30° Tw., 6d. to 8d. per gal. Manchester: Brown, £9 10s.; grey, £11 10s.

Charcoal.—£5 5s. to £10 per ton, according to grade and locality.

Methyl Acetone.—40-50%, £45 to £48 per ton.

Wood Creosote.—Unrefined 6d. to 1s. 6d. per gal., according to boiling range.

Wood, Naphtha, Miscible.—2s. 9d. to 3s. 3d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.

Wood Tar.—£2 to £3 per ton.

Intermediates and Dyes

Acid, Benzoic, 1914 B.P. (ex toluol).—1s. 9½d. per lb. d/d buyer's works.

Acid, Gamma.—Spot, 4s. per lb. 100% d/d buyer's works.

Acid, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

Acid Naphthionic.—1s. 8d. per lb.

Acid, Neville and Winther.—Spot, 3s. per lb. 100%.

Acid, Sulphanilic.—Spot, 8d. per lb. 100%, d/d buyer's works.

Aniline Oil.—Spot, 8d. per lb., drums extra, d/d buyer's works.

Aniline Salts.—Spot, 8d. per lb. d/d buyer's works, casks free.

Benzidine, HCl.—2s. 5d. per lb., 100% as base, in casks.

o-**Cresol** 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.

p-**Cresol** 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.

m-**Cresol** 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

Dichloraniline.—1s. 11½d. to 2s. 3d. per lb.

Dimethylaniline.—Spot, 1s. 6d. per lb., package extra.

Dinitrobenzene.—8d. per lb.

Dinitrotoluene.—48/50° C., 9d. per lb.; 66/68° C., 10½d.

Dinitrochlorbenzene, Solid.—£72 per ton.

Diphenylamine.—Spot, 2s. per lb., d/d buyer's works.

α-Naphthol.—Spot, 2s. 4d. per lb., d/d buyer's works.

β-Naphthol.—In bags, £88 15s. per ton; in casks, £89 15s.

α-Naphthylamine.—Lumps, 1s. per lb.; ground, 1s. 0½d.

β-Naphthylamine.—Spot, 2s. 9d. per lb., d/d buyer's works in casks.

o-**Nitraniline.**—3s. 11d. per lb.

m-**Nitraniline.**—Spot, 2s. 7d. per lb., d/d buyer's works.

Latest Oil Prices

London, Oct. 14.—**Linseed Oil** was quiet. Spot, £27 (small quantities); Oct., £24 7s. 6d.; Nov.-Dec., £24 12s. 6d.; Jan.-April, £24 15s.; May-Aug., £24 17s. 6d., naked. **Soya Bean Oil** was steady. Oriental (bulk), spot, Rotterdam, £25. **Rape Oil** was inactive. Crude, extracted, £33 10s.; technical, refined, £34 10s., naked, ex wharf. **Cotton Oil** was slow. Egyptian crude, £26 10s.; refined common edible, £29 10s.; deodorised, £31 10s., naked, ex mill (small lots £1 10s. extra). **Turpentine** was steady. American, spot, 38s. 6d. per cwt.

Hull.—**Linseed Oil,** spot, quoted £25 2s. 6d. per ton; Oct., £24 10s.; Nov.-Dec., £24 12s. 6d.; Jan.-April, £24 15s.; May-Aug., £24 17s. 6d. **Cotton Oil,** Egyptian, crude, spot, £26 10s.; edible, refined, spot, £29; technical, spot, £29; deodorised, £31, naked. **Palm Kernel Oil,** crude, f.m.q., spot £24 10s., naked. **Groundnut Oil,** extracted, spot, £34; deodorised, £37. **Rape Oil,** extracted, spot, £32 10s.; refined, £33 10s. **Soya Oil,** extracted, spot, £29 10s.; deodorised, £32 10s. per ton. **Cod Oil,** f.o.r. or f.a.s., 25s. per cwt., in barrels. **Castor Oil,** pharmaceutical, 42s. per cwt.; firsts, 37s.; seconds, 35s. **Turpentine,** American, spot, 40s. 9d. per cwt.

Inventions in the Chemical Industry

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Open to Public Inspection

CRYSTALLISATION OF DEXTROSE.—International Patents Development Co. April 1, 1935. 15190/35.

MANUFACTURE OF ARTIFICIAL ASPHALTS.—Standard Oil Development Co. April 5, 1935. 33178/35.

PREPARATION OF ARTIFICIAL ASPHALTS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. April 3, 1935. 33658/35.

IMPREGNATION OF WOOD.—Chemische Fabrik Grunau Landshoff and Meyer, A.-G. Mar. 29, 1935. 35613/35.

ARSENOBENZENE-MONO-SULPHOXYLATES.—I. G. Farbenindustrie. April 3, 1935. 2053/36.

LUBRICATING-OILS.—Standard Oil Development Co. Mar. 29, 1935. 3021/36.

WATERPROOFING-COMPOSITIONS.—Victor Chemical Works. Mar. 29, 1935. 3106/36.

POLYMERS OF ISOBUTYLENE.—Standard Oil Development Co., and I. G. Farbenindustrie. Mar. 29, 1935. 5881/36.

ALCOHOLIC FERMENTATION.—Usines de Melle, and F. Boinot. Mar. 30, 1935. 7049/36.

ALCOHOLIC FERMENTATION.—Usines de Melle. April 1, 1935. 7491/36.

PROCESS FOR THE HYDROGENATION OF HEAVY OILS, tars, and heavy hydrocarbons in general and products obtained therefrom. Compagnie de Bethune. April 2, 1935. 7518/36.

PROCESS FOR THE HYDROGENATION OF HEAVY OILS, tars, and liquid hydrocarbons in general. April 3, 1935. 7519/36.

SEPARATION OF GASEOUS MIXTURE by washing.—Ges für Lindés Eismachinen, A.-G. April 4, 1935. 7902/36.

PURIFYING FERROUS METALS.—Electro Metallurgical Co. April 3, 1935. 7930/36.

PRODUCING CITRIC ACID.—J. Zender. April 4, 1935. 8003/36.

PREPARATION OF INHIBITORS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. April 3, 1935. 8283/36.

CRACKING HYDROCARBON COMPOUNDS.—Naamlooze Vennootschap Nieuwe Octrooi Maatschappij. April 4, 1935. 8933/36.

PREPARATION OF PHOTOGRAPHIC EMULSIONS.—B. Claus. April 5, 1935. 8939/36.

PROCESS OF CONCENTRATING AQUEOUS RUBBER DISPERSIONS.—Metallges, A.-G. April 3, 1935. 9151/36.

PECTIN EXTRACTS.—A. Buchting. March 29, 1935. 9384/36.

NITROGEN-CONTAINING ORGANIC COMPOUNDS and their application.—E. I. du Pont de Nemours and Co. Mar. 29, 1935. 9458/36.

SYNTHETIC RESINS and their manufacture.—E. I. du Pont de Nemours and Co. April 3, 1935. 9459/36.

MANUFACTURE OF ACID AZO DYESTUFFS, in particular for the dyeing and printing of animal textile fibres.—Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies Etablissements Kuhlmann. April 2, 1935. 9538/36.

ALCALOID AND ANAESTHETIC SALTS and the manufacture thereof.—J. L. Regnier. April 2, 1935. 9630/36.

DIAZONIUM SALTS.—Soc. of Chemical Industry in Basle. April 2, 1935. 9633/36.

SYNTHETIC RESINS and their manufacture.—E. I. du Pont de Nemours and Co. April 3, 1935. 9693/36.

MANUFACTURE OF DIAZONIUM SALTS.—Soc. of Chemical Industry in Basle. April 2, 1935. 9771/36.

MANUFACTURE OF 2:4-DIMETHYL-3-(or-5)-NITROBENZYLCHLORIDE. I. G. Farbenindustrie. April 4, 1935. 9893/36.

PRODUCTION OF FAST DYEINGS on cellulose ethers or esters.—Soc. of Chemical Industry in Basle. April 5, 1935. 9894/36.

TREATMENT OF CELLULOSE ESTERS and materials comprising the same.—British Celanese, Ltd. April 3, 1935. 9975/36.

COLOURED CONDENSATION PRODUCTS.—Soc. of Chemical Industry in Basle. April 5, 1935. 10119/36.

MANUFACTURE OF FABRICS.—I. G. Farbenindustrie. April 5, 1935. 10122/36.

ALIPHATHIC HALOGEN-NITRO-ALCOHOLS.—I. G. Farbenindustrie. April 4, 1935. 10123/36.

ELECTRODEPOSITION OF ZINC.—Imperial Chemical Industries, Ltd. April 4, 1935. 10171/36.

Specifications Accepted with Date of Application

PROCESS FOR PURIFYING COKE-OVEN and like gases.—Ruhrchemie, A.-G. Jan. 24, 1934. 454,368.

PROCESS FOR PURIFYING COKE OVEN and like gases.—Ruhrchemie, A.-G. Dec. 1, 1934. 454,369.

PREPARATION OF BAKED CEREAL FOODSTUFFS.—Imperial Chemical Industries, Ltd. Jan. 29, 1934. 454,421.

PIGMENTS CONTAINING TITANIUM.—A. Carpmael (I. G. Farbenindustrie. Feb. 26, 1935. 454,324.

MANUFACTURE OF SULPHURIC ACID by the contact process.—C. F. R. Harrison, A. N. Clark, C. L. Hilton, and Imperial Chemical Industries, Ltd. Feb. 28, 1935. 454,327.

AQUEOUS BITUMINOUS EMULSIONS.—Aktieselskabet for Kemisk Industri. June 29, 1934. 454,487.

SALTS OF ACRIDINIUM BASES.—W. W. Groves (I. G. Farbenindustrie). Mar. 26, 1935. 454,375.

ANTHRAQUINONE COMPOUNDS containing nitrogen.—W. W. Groves (I. G. Farbenindustrie). Mar. 26, 1935. 454,423.

MANUFACTURE AND USE OF SAPONIFIED VINYL ESTERS particularly for use in the treatment of textile materials.—British Celanese, Ltd., D. Finlayson, and C. E. Stafford. Mar. 27, 1935. 454,425.

TREATING TEXTILE FIBRES.—W. W. Groves (I. G. Farbenindustrie). Mar. 27, 1935. 454,559.

MANUFACTURE OF DYESTUFFS SOLUBLE IN WATER.—W. W. Groves (I. G. Farbenindustrie). Mar. 28, 1935. 454,493.

LINING OF APPARATUS for use when reacting carbon monoxide with hydrogen at elevated temperature and under pressure.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)). (I. G. Farbenindustrie). Mar. 29, 1935. 454,428.

LUBRICATING COMPOSITIONS.—A. S. Levesley, and Imperial Chemical Industries, Ltd. Mar. 29, 1935. 454,386.

MANUFACTURE OF THERAPEUTICALLY ACTIVE SUBSTANCES.—A. Carpmael (I. G. Farbenindustrie). Mar. 30, 1935. 454,440.

MANUFACTURE OF POLYMETINE DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie). Mar. 30, 1935. 454,624.

PREPARATION OF BREAD and other baked cereal foodstuffs.—E. I. du Pont de Nemours and Co. Mar. 31, 1934. 454,513.

PRODUCTION OF ALKALI NITRATE.—I. G. Farbenindustrie. April 7, 1934. 454,570.

MANUFACTURE OF CHLORINATED RUBBER.—J. G. Moore, and Imperial Chemical Industries, Ltd. April 2, 1935. 454,576.

HALOGEN DERIVATIVES OF METHANE.—J. P. Baxter, and Imperial Chemical Industries, Ltd. April 2, 1935. 454,577.

MANUFACTURE OF MONO-AZO DYESTUFFS insoluble in water.—J. R. Geigy, A.-G. April 9, 1934. 454,445.

MANUFACTURE OF NON-KNOCKING MOTOR FUEL by the catalytic reaction of carbon monoxide and hydrogen.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)). (I. G. Farbenindustrie). April 5, 1935. 454,389.

MANUFACTURE OF ESTERS of polycyclic alcohols.—Schering-Kahlbaum, A.-G. April 7, 1934. 454,632.

MANUFACTURE OF SYNTHETIC RESINS.—British Industrial Solvents, Ltd., H. Langwell, and C. B. Maddocks. April 10, 1935. 454,635.

MANUFACTURE OF KETO-DICARBOXYLIC ACIDS and their lactones.—W. W. Groves (Monsanto Chemical Co.). April 10, 1935. 454,636.

MANUFACTURE OF VALUABLE HYDROCARBONS by the thermal treatment of carbonaceous materials.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)). (I. G. Farbenindustrie). May 7, 1935. 454,391.

MANUFACTURE OF ALBUMINOUS ARTIFICIAL MASSES and articles produced therefrom.—Deutsche Hydrierwerke, A.-G. July 31, 1934. 454,611.

PRODUCING PURE ALUMINA and crude potassium sulphate from alunite.—Nihon Denki Kogyo Kabushiki Kaisha, S. Yonemura, T. Okazawa, and K. Osada. Aug. 6, 1935. 454,331.

MANUFACTURE OF RESINS and resin-like products.—Deutsche Hydrierwerke, A.-G. Sept. 27, 1934. 454,616.

PRODUCING CARBOXYLIC SATURATED AND/OR UNSATURATED ACIDS, their salts, and/or their ketol-esters.—Naamlooze Venootschap de Bataafsche Petroleum Maatschappij. Oct. 8, 1934. 454,400.

PREPARING SUBSTITUTED AND UNSUBSTITUTED AMINO-*m*-PHENANTHROLINES in which the amino-group is in the benzene nucleus of the phenanthroline ring system.—J. Boëseken and W. G. Bijlsma. Oct. 3, 1935. 454,525.

PREPARING HALOGENATED PHENANTHROLINES.—Naamlooze Vennootschap Nederlandsche Kininefabriek. Dec. 22, 1934. 454,526.

PURIFICATION AND REFINEMENT OF MAGNESIUM and magnesium alloys.—P. Briske, and V. Prohl (trading as Briske and Prohl), and A. Luschenowsky. Oct. 7, 1935. 454,335.

PROCESS FOR CONTINUOUS EXTRACTION OF VITAMINES and products containing vitamins.—A. Nyrop. Oct. 16, 1935. 454,528.

ALKALINE TEXTILE TREATING LIQUORS.—Deutsche Hydrierkerke, A.-G. Oct. 18, 1934. 454,617.

MANUFACTURE OF AZO DYESTUFFS.—Chemical Works, formerly Sandoz. Nov. 22, 1934. 454,470.

PROCESS OF MAKING PIGMENTS.—New Jersey Zinc Co. Dec. 28, 1934. 454,343.

VULCANISATION OF RUBBER.—Belvedere Chemical Co., Ltd. Mar. 9, 1935. 454,410.

PREPARATION OF ALUMUM ETHYLATE.—Consortium für Elektrochemische Industrie Ges. May 9, 1935. 454,480.

Applications for Patents
(October 1 to 7 inclusive.)

SYNTHETIC GLUES.—A. G. Bloxam (Soc. of Chemical Industry in Basle). 26771.

MANUFACTURE OF 5.6.7.8-TETRAHYDRONAPHTHALENES.—A. Carpmael (I. G. Farbenindustrie). 26678.

SYNTHETIC RESINS.—P. M. Clark. 26777.

MANUFACTURE OF POLYMERIC PRDUCTS.—W. W. Groves (I. G. Farbenindustrie). 26770.

MANUFACTURE OF URETHANE-LIKE COMPOUNDS.—W. W. Groves (I. G. Farbenindustrie). 27120.

DYEING OF MIXED FIBRES.—W. W. Groves (I. G. Farbenindustrie). 27121.

MANUFACTURE OF CARBOCYCLIC BASIC PRODUCTS.—W. W. Groves (I. G. Farbenindustrie). 27235.

HYDROXYMETHYL DERIVATIVES OF PURPURIN AND ALIZARIN.—R. Hill, and D. Richter. 26715.

HYDROXYANTHRAQUINONE CARBOXYLIC ACIDS.—R. Hill. 26716.

TREATMENT OF PHOSPHATIC ORES, ETC.—I. G. Farbenindustrie. (Germany, Dec. 5, '35.) 26772.

COLOURING OF VEGETABLE MATERIALS.—I. G. Farbenindustrie. (Germany, Oct. 3, '35.) 26861.

MANUFACTURE OF AMIDE-LIKE CONDENSATION PRODUCTS of aromatic sulphonic acids.—I. G. Farbenindustrie. (Germany, Oct. 5, '35.) 26890.

MANUFACTURE OF AMIDE-LIKE CONDENSATION PRODUCTS of aromatic sulphonic acids.—I. G. Farbenindustrie. (Germany, Oct. 12, '35.) 26891.

MANUFACTURE OF LIVER, ETC. EXTRACTS.—I. G. Farbenindustrie. (Germany, Oct. 5, '35.) 26986.

MANUFACTURE OF POLYMETHINE DYESTUFFS.—I. G. Farbenindustrie. (Germany, Oct. 31, '35.) 27237.

PROCESS FOR SENSITISING PHOTOGRAPHIC SILVER HALIDE EMULSIONS.—I. G. Farbenindustrie. (Germany, Oct. 24, '35.) 27238.

CHLORINATION OF PARAFFIN WAX.—Imperial Chemical Industries, Ltd., and D. W. F. Hardie. 26680.

COLOURING ACETATE ARTIFICIAL SILK.—Imperial Chemical Industries, Ltd., and B. Shaw. 26776.

PRODUCTION OF CELLULOSE ETHERS.—Imperial Chemical Industries, Ltd., and J. Craik. 27160.

PRODUCTION OF SOLUBLE FERMENTS.—Intensive Cultivations, Ltd. 27229,

TREATMENT OF LUBRICATING OILS.—Intercontinental Corporation of America, Inc., and A. Gruenfeld. 26695.

MANUFACTURE, ETC. OF COLOURED COMPOUNDS.—G. W. Johnson (I. G. Farbenindustrie). 26645.

MANUFACTURE, ETC. OF MASSES FOR SELF-LUBRICATING POROUS BEARINGS.—G. W. Johnson (I. G. Farbenindustrie.) 26646.

REMOVAL OF SULPHUR FROM GASES.—G. W. Johnson (I. G. Farbenindustrie.) 26800.

PRODUCTION OF OXIDATION PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) 27252.

MEANS FOR RENDERING PRESSURE EXTRACTS, ETC. of destructive hydrogenation of coals, etc. stable.—G. W. Johnson (I. G. Farbenindustrie.) 27253.

SIZING OF PAPER.—G. W. Johnson (I. G. Farbenindustrie.) 27254.

TREATMENT OF LIQUIDS prior to measuring their pH values with an antimony electrode.—G. Kent, Ltd. 26888.

TREATMENT OF OIL, ETC.—P. St. G. Kirke. 26659.

PROCESS OF ACCELERATING PRECIPITATION of precipitates from liquids.—G. W. Kühl. (Germany, Oct. 7, '35.) 27248.

PROCESS OF ACCELERATING PRECIPITATION of precipitates from liquids.—G. W. Kühl. (Germany, April 22.) 27249.

PROCESS OF ACCELERATING PRECIPITATION of precipitates from liquids.—G. W. Kühl. (Germany, June 8.) 27250.

PROCESS OF ACCELERATING PRECIPITATION of precipitates from liquids.—G. W. Kühl. (Germany, July 25.) 27251.

ACETYL-SALICYCLIC ACID COMPOSITION.—E. B. Putt. 26792.

DETECTION OF GASES, ETC., IN AIR.—O. Ruhl (1922), Ltd., and L. A. Sharland. 27154.

MANUFACTURE OF REDUCTION PRODUCTS derived from dehydroandrosterone.—Schering-Kahlbaum, A.-G. (Germany, Oct. 7, '35.) 27133.

MANUFACTURE OF STARCH PRODUCTS.—W. A. Scholten's Chemische Fabrieken N. V. (Holland, Oct. 7, '35.) 26987.

PRODUCTION OF MOTOR FUELS.—Standard Oil Development Co. (United States, Dec. 17, '35.) 26618.

LOW-TEMPERATURE DISTILLATION OF COAL LIGNITE, ETC.—F. Tassara. (Italy, Oct. 4, '35.) 26932.

LOW-TEMPERATURE DISTILLATION OF COAL LIGNITE, ETC.—F. Tassara. (Italy, Nov. 21, '35.) 26933.

MANUFACTURE OF TITANYL SULPHATE DIHYDRATE.—W. J. Tennant (Titan Co., Inc.). 26814.

MANUFACTURE OF ACYL DERIVATIVES of germinal gland hormones. W. P. Williams (Schering-Kahlbaum, A.-G.). (Oct. 10, '35.) 27136.

Chemical and Allied Stocks and Shares

THE industrial and other sections of the Stock Exchange have been somewhat less active this week. Prices tended to decline moderately, but it is perhaps hardly surprising that after the good advances established recently a certain amount of profit-taking has developed.

Imperial Chemical were active and at 42s. 1½d. have held the greater part of their rise of the previous week. On the basis of last year's 8 per cent. dividend, which it is generally anticipated will be maintained, the shares still offer a rather larger yield than many other leading industrial shares, despite the fact that there are few companies which would benefit as much from the development of better conditions for international trade. Salt Union touched 44s. at one time. There was a slight decline to 43s. 9d. later, which, however, compares with 43s. 4½d. a week ago. Borax Consolidated, market views in connection with which were mentioned last week, have moved up further from 34s. 9d. to 35s. 6d.

Unilever were again prominently active and have risen further on the week from 38s. 7½d. to 40s. 3d. on the belief that the outlook for the company is much improved. There are now apparently more general hopes that a small increase in the interim dividend may be announced next month. Distillers were in demand and responded in price from 108s. 9d. to 110s. The disposition is to take the view that unless the directors contemplate the distribution of a bonus of some kind in the future an increase in dividend is in prospect. Last year 20 per cent. was paid, but this was a conservative dividend. Imperial Smelting continued their improvement and reached 17s. at one time. Subsequently there was a reaction to 16s. 6d., which is 6d. higher than the price ruling a week ago. The increased interest in the shares is due to the hopes attaching to the results, due next month, and to the belief that prospects of the International Zinc Cartel being reformed are now much improved. Babcock and Wilcox were fairly steady. Despite the absence of an increase in the interim dividend, the market is budgeting for a larger total payment for the year. Fison, Packard and Prentice were slightly higher at 45s. 7½d. and Erinoid remained steady on the maintenance of the dividend. British Glues were firm. Cooper, McDougall and Robertson were lower at around 36s., but the price was not apparently tested a great deal by business as the shares continue to be held firmly in view of the company's strong balance sheet position. Goodlass Wall and Lead Industries held up well at 14s. 6d.

There was again considerable activity in Turner and Newall on the good outlook indicated for the company, and although best prices were not held there has been an advance on the week from 101s. 3d. to 103s. British Drug Houses and Burt, Boulton and Haywood were steady, the last named on the good increase in profits shown by the results.

There was steady demand for steel shares reported, the further increase in steel production having attracted attention. In many cases prices reacted later, but Dorman Long remained good on expectations that a further blast furnace will be re-lit at the works and on market estimates that a dividend of 10 per cent. is not unlikely on the ordinary shares. It has to be remembered that the chairman has stated on numerous occasions that it is the intention to continue to follow a conservative dividend policy until there has been a reduction in prior interest charges, but it is assumed that there has been a marked increase in profits during the past financial year. Consett Iron were also favoured and these 6s. 8d. shares have now reached 16s., due to the belief that dividends can be expected to be resumed for the current year with a good payment. Some market men are already estimating that earnings on the ordinary capital may be running at the rate of 25 per cent. per annum. Nevertheless, it has to be borne in mind that the dividend will be conditioned in a large measure by the amount it is decided to allow for depreciation and reserves.

Associated Portland Cement were active on favourable views of dividend prospects. Both Barry and Staines Linoleum and Michael Nairn and Greenwich were steady and Wall Paper deferred were again around 50s. The dividend announcement of the last-named company will probably be made at the end of the month. Calico Printers, Bradford Dyers and various other textile shares lost part of their recent improvement and British Celanese were inclined to fluctuate pending publication of the past year's results.

Oil shares were less prominent, but the leading shares held up well, aided by the favourable dividend estimates current.

Company News

Midland Tar Distillers.—The report for the year ended June 30, 1936, shows a profit on trading of £73,232, rents and transfer fees £85, making £73,317, less directors' fees £2,267, interest £1,337, tax £15,393, depreciation £1,592, and reserves £9,643, leaving profit £43,084, to which is added balance brought forward £22,078, making £65,162. The directors recommend final dividend on ordinary shares of 2½ per cent., making 5 per cent., free of tax, for the year, £9,543; transfer to obsolescence and depreciation £15,000, and to general reserve £5,000, carrying forward £20,541. Meeting, Birmingham, October 22, at 2.30.

Forthcoming Events

BIRMINGHAM.

Oct. 22.—Institute of Metals (Birmingham Section). Joint meeting with the Iron and Steel Institute. "Strip Sheet Production." G. A. V. Russell. 7 p.m. James Watt Memorial Institute, Birmingham.

BRISTOL.

Oct. 22.—Institute of Chemistry (Bristol and South West Counties Section). "Reminiscences of an Old-Established Analytical Laboratory." Dr. J. J. Fox. 5.30 p.m. Chemical Department, Bristol University.

HULL.

Oct. 20.—Hull Chemical and Engineering Society. "Why do we Use Synthetic Resins?" Dr. Ewald Fonrobert. 7.45 p.m. Municipal Technical College, Hull.

LIVERPOOL.

Oct. 23.—Society of Chemical Industry (Liverpool Section). "The Society, the Industry and the University." Professor T. P. Hilditch. 6 p.m. The University, Liverpool.

MANCHESTER.

Oct. 21.—Manchester Metallurgical Society. Presidential address. Professor F. C. Thompson. 7 p.m. Constitutional Club, St. Ann's Street, Manchester.

SHEFFIELD.

Oct. 20.—Department of Glass Technology, Sheffield University. Informal coming of age dinner organised by past and present staff and students. 7 p.m. Royal Victoria Station Hotel.

Oct. 21.—Society of Glass Technology. General meeting. 10.30 a.m. and 2 p.m. Department of Glass Technology, Sheffield.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

(NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

CURRIE ROWLANDS AND CO., LTD., Seacombe, manufacturers of chemical manures, etc. (M., 17/10/36.) October 2. £5,000 mortgage to W. E. Littler, Wallasey, and others; charged on lands and buildings at Seacombe.

Companies Winding-up Voluntarily

POWER PETROLEUM (NORTH), LTD. (C.W.U.V., 17/10/36.) By special resolution, September 30.

STENALEES CHINA CLAY CO., LTD. (C.W.U.V., 17/10/36.) By special resolution, September 30. Mr. J. W. Shaffery, chartered accountant, of St. Austell, appointed liquidator.

WELSH LIME, LTD. (C.W.U.V., 17/10/36.) By special resolution, October 1. Mr. R. J. H. Lloyd, of Swansea, nominated liquidator.

Receiverships

SCOLITE, LTD., manufacturers of synthetic products, etc., 21 Broadwater Road, Welwyn Garden City. (R., 17/10/36.) S. G. Hillyer, of Finsbury Circus House, Blomfield Street, E.C., was appointed receiver and manager on October 1, 1936, under powers contained in debentures authorised by resolutions of April 27, 1933, and January 22, 1934.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Egypt.—A firm of commission agents in Cairo, whose representative is at present in the United Kingdom, desires to obtain agencies for drugs and pharmaceutical preparations. (Ref. No. 344.)

New Chemical Trade Marks

Compiled from official sources by Gee and Co., patent and trade mark agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2.

Rhodox. 563,187. Chemical substances used in manufactures, or philosophical research, and anti-corrosives, but not including paints or chemical substances for use in photography and not including any goods of a like kind to any of those excluded goods. British Dyestuffs Corporation, Ltd., Imperial Chemical House, Millbank, London, S.W.1. September 27, 1935.

Rayweld. 564,495. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Trevithick Weld, Ltd., Quadrant House, 55/58 Pall Mall, London, S.W.1. November 19, 1935.

Setamol. 562,690. Chemical substances used in manufacture for addition to dye-baths for preventing the dyeing of silk when a woollen fabric containing silk is dyed. I. G. Farbenindustrie. September 4, 1935. Address for service in the United Kingdom is, c/o Abel & Imray, 30 Southampton Buildings, London, W.C.2.

Bottogas. 564,611. Butane, being a combustible fluid for use as gas in gas burners. Spensers (London), Ltd., 6 London Street, London, W.2. November 25, 1935.

New Companies Registered

Metal Merging Corporation, Ltd.—Registered October 2. Nominal capital, £500. To acquire from the A. D. Syndicate, Ltd., inter alia, the benefit of certain inventions relating to electro-plating aparatus; and to carry on the business of electro-platers in all its branches, mechanical and electrical engineers, metal workers, manufacturers of and dealers in electro-plating apparatus, etc. Subscribers: H. W. Brown, 72 Felstead Road, Orpington, Kent, and W. H. Walford.

James McGilvray and Company, Ltd., 370 Pinkston Road, Glasgow.—Registered September 28 in Edinburgh. Nominal capital, £500. Soap manufacturers and dealers, etc. Directors: James McGilvray and Mrs. Olive M. McGilvray.

G. H. Briggs, Ltd., 4 Commercial Street, Knott Mill, Manchester.—Registered October 1. Nominal capital, £10,000. Manufacturers of and dealers in dyes, colours, enamels, paints, etc. Directors: George H. Briggs, John H. L. Briggs, George C. Briggs and Wm. D. Briggs.

Dent's Cellulose, Ltd.—Registered October 1. Nominal capital, £2,000. To acquire the business of a cellulose manufacturer carried on by Jack A. Dent at Coatham, Redcar. Directors: Jack A. Dent (permanent chairman and managing director), 19 Arthur Street, Redcar; Noel D. Ridsdale, and Oswald Harrison.

Sulphur Patents, Ltd.—Registered October 7. Nominal capital £100 in £1 shares.. To adopt, upon signature, an agreement between Imperial Chemimcal Industries, Ltd. and Bolidens Gruvaktiebolag, relating to the development of certain processes for the production of sulphur; to act as a parent holding company. Subscribers: Arthur S. Osborne, 24 Braemar Chescent, Leigh-on-Sea, and David G. Reynolds.

Cannock Agricultural Co., Ltd., Walk Mill Lane, Bridgtown, near Cannock, Staffs.—Registered October 7. Nominal capital, £20,000 in 20,000 ordinary shares of £1 each. To acquire the business of an artificial manure manufacturer and general agricultural merchant carried on by A. T. Vernon at Cannock as the Cannock Agricultural Co., and to carry on the business of manufacturers of and dealers in fertilisers, importers and exporters of and dealers in phosphates (ground and unground), superphosphates, potash, nitrogenous materials, insecticides, fungicides, disinfectants and all other commercial chemicals, etc. Directors: Arthur T. Vernon; Arthur T. Vernon, jnr.; John W. Vernon, 321 Tettenhall Road, Wolverhampton, and Frank Vernon, Sledmere, Lothians Road, Tettenhall, Wolverhampton.

Shaka Salt and Chemical Co., Ltd., 57 High Street, Kingsland, E.8.—Registered October 12. Nominal capital £3,000 in 3,000 shares of £1 each. Manufacturers, producers, brokers, importers and exporters of and factors in salt, brine, rock salt, alkalis, chlorine, bleaching powder and liquors, etc. Directors: Herbert A. Manger (managing director), "Arlingtan," Bishops Avenue, Finchley, Middlesex; Harold G. Manger, and Hugh K. Frazer.

From Week to Week

HOFFMANN-LA-ROCHE CHEMICAL WORKS, LTD., 51 Bowes Road, N.13, has increased its nominal capital by the addition of £90,000, in £1 ordinary shares, beyond the registered capital of £10,000.

THE TREASURY has made an Order under Section 10(5) of the Finance Act, 1926, exempting veratrine from Key Industry Duty from October 17, until December 31, 1937. The Treasury Order will shortly be published by H.M. Stationery Office.

THE NOMINAL CAPITAL of "Anti-Mist," Ltd., manufacturers of perfumes, etc., 136 Wool Exchange, Coleman Street, E.C.2, has been increased by the addition of £1,300 in £1 ordinary shares, beyond the registered capital of £2,500.

AFTER BEING CUT INTO PIECES by men of the City Engineer's Department, a large basking shark, washed up at Joppa beach, Edinburgh, was removed to the works of the Edinburgh Chemical Co., Ltd., Loanhead. The firm found it would not be worth while to secure the by-products and the shark was used to make manure. It weighed approximately two tons.

AS THE RESULT OF AN EXPLOSION which damaged a new steel furnace in course of construction at Dorman Long and Company's Cleveland Works, South Bank, near Middlesbrough, on Sunday, one man was killed and twelve others were injured. The man killed was Ernest Kruse (44), of Granville Road, Grangetown. The majority of the men are bricklayers and fitters. The explosion was heard a mile away, and windows in the vicinity were shattered.

THE ACHEMA VIII CHEMICAL ENGINEERING SHOW will take place from July 2 to July 11, 1937, on the occasion of the annual meeting of German chemists, together with the celebration of the Semi-Centennial of the Verein Deutscher Chemiker (Society of German Chemists) at Frankfort-on-the-Main. The advance booking of floor space which has just been closed has shown that of the 125,000 square feet floor space available for exhibition purposes about 100,000 square feet have been booked by German firms in the chemical engineering industry.

KINTYRE HAS BEEN SUGGESTED AS A CENTRE for the distillation of oil from coal, by ex-Provost Smith, of Campbeltown, at a meeting held in response to an invitation of the Economic Committee of the Scottish Development Council for suggestions to be placed before the committee appointed by the Secretary of State for Scotland on the conditions of the Highlands and Islands. Ex-Provost Smith said that Kintyre's greatest source of undeveloped wealth lay in the coal deposits. The only Kintyre mine, that at Drumlembie, closed down some years ago, but it was estimated that there were 70,000,000 tons of coal in the area, only 3,000,000 of which had been brought to the surface.

THREE MEN WERE SEVERELY BURNED in a mishap at the Redcar works of Dorman Long and Co., Ltd., on October 12. They were: Thomas Sanderson (45), smelter, of 6 The Vale, Grove Hill, Middlesbrough; Thomas Joyce (44), smelter, of Adshead Road, Dormanstown; and J. W. Kaine (28), smelter, of Westfield Way, Dormanstown. The men were removed to the North Ormesby Hospital with burns on the head, face and arms. It is believed that the mishap was due to a ladle, with which molten metal was being tapped, not being quite dry. White-hot steel splashed in all directions, and some men working on neighbouring furnaces were splashed, and were treated for minor burns.

THE CLYDE NAVIGATION TRUSTEES have granted a lease of ground at Shieldhall estate to the Clyde Soya Meal Factory, the chairman of which is Mr. John MacLean, managing director of Thomas Borthwick (Glasgow), Ltd., grain importers. About 50 men will be employed in the new works at the outset. From soya beans, which are grown mainly in China, there is extracted about 13 per cent. of oil, which is used for edible purposes. The residue is ground into meal, largely used for cattle and poultry feeding; it is rich in protein, and is highly valued by stock feeders. Until early this year a considerable quantity of soya meal was imported into Scotland from Northern Europe, but owing to the raising of the import duty from 10 to 20 per cent., the price became almost prohibitive. Buildings and machinery for the new factory will cost about £80,000.

A WAGE ADVANCE TO ALL ITS WORKERS has been granted on Tees-side by Athole G. Allen (Stockton), Ltd., of the Tees Bridge Chemical Works, and hopes are entertained that other chemical firms in the country will follow suit. A new scale of wages provides for a rate of 1s. 4d. an hour for process workers; 1s. 2¼d. for labourers; while general rates are 1s. 2¼d. and 1s. 0⅜d. respectively. The men are also to benefit as a result of new holiday arrangements. After six months' work they will get three days' holiday and six days after a year's work. Public holidays such as Christmas Day, Good Friday and Whit Monday will be paid for. Another concession on the part of the firm is to pay for the first three days an employee is off work through accident if the absence is less than a month. The company has been congratulated on its new conditions by the Transport and General Workers' Union.

THE NAME OF ENDOCRINES, LTD., manufacturers of medical preparations, etc., 54 Conduit Street, W.1, has been changed to Endocrines-Spicer, Ltd., by permission of the Board of Trade.

THE ALPHA CEMENT CO. has compiled a brochure dealing with the works and activities of the undertaking. A copy of the brochure has been sent to cement merchants throughout the country and also to the company's shareholders.

THE BRITISH SULPHATE OF AMMONIA FEDERATION, LTD., has changed its address to Gas Industries House, 1 Grosvenor Place, London, S.W.1. Telephone Nos.: Sloane 4554 (nine lines); Victoria 4444 (home and export orders).

PERMISSION WAS GRANTED by Linlithgow Dean of Guild Court on Tuesday to Nobel's, Ltd., to carry out alterations, to cost £15,000, to their Regent Factory, Linlithgow, which has been closed for some months through transfer of the work to Stevenston.

GUARANTEES OF £36,000 HAVE BEEN RECEIVED by the general committee for the organising of the Empire Exhibition to be held in Glasgow in 1938. Of this amount G. and J. Weir, Ltd., and Imperial Chemical Industries, Ltd., have each given £10,000; and the British Oxygen Co., Ltd., have given £5,000.

THE ROOF OF THE EXHAUSTER HOUSE at Tipton Urban Council's gasworks was blown off on October 8, by an explosion of gas. Two men who were working in the building at the time had remarkable escapes. The explosion did not interfere with the gas supply in any way.

A NEW INDUSTRY IS TO BE ESTABLISHED in Glasgow for the manufacture of plaster boards for the building trade. Lord Forteviot, a director of the Distillers Co., Ltd., stated at a meeting in Glasgow last week, that one of their subsidiary concerns, Gyproc Products, Ltd., had secured a site at Shieldhall, and a new factory, costing about £100,000, would be built immediately.

THE 1936-37 SESSION of the Institution of Chemical Engineers will open with a public lecture to be held on October 30, at 6.30 p.m., when Professor F. A. Lindemann, F.R.S., will speak on "Research at the Lowest Temperatures and its Importance to Industry." The lecture will be delivered at the Institution of Civil Engineers, the president, Dr. Herbert Levinstein, being in the chair.

AT A MEETING OF THE LIVERPOOL CITY COUNCIL on October 7, a recommendation by the Finance Committee to sanction an advance to Manesty Machines, Ltd., of a sum not exceeding £10,000 was withdrawn in order to correct a technical error in the minute. The advance as recommended was subject to repayment of the principal (with 4 per cent. interest) within twenty years, the borrower to pay stamp duty and one-half per cent. to cover out-of-pocket expenses. The advance is in respect of buildings to be erected by the company on land on the Corporation's Speke estate. The governing director of the company is Alderman Edwin Thompson, J.P. The advance is being made under a new Liverpool Corporation Act.

THE WOOL INDUSTRIES' RESEARCH ASSOCIATION is now engaged on tests which may enable the wool industry to overcome the scarcity of olive oil caused by the Spanish civil war. The supplies of olives have been greatly reduced by the war, and the chemists at Leeds are hoping to produce a satisfactory substitute oil. Among the samples of synthetic oil submitted to the research association is one from Mr. Walter Garner, chief chemist to Lister and Co., Ltd., of Manningham Mills, Bradford. The Spanish war has caused the price of olive oil to rise from £50 to £90 a ton. As it is an important commodity in the wool industry, over 4,000 tons being used annually in the spinning process, some anxiety is felt. Mr. Garner claims to have perfected his synthetic oil after years of experimental work. He estimates that if it were used generally it would save the industry £120,000 a year. The oil is made from raw materials grown in the Empire.

FOLLOWING PROTRACTED NEGOTIATIONS by representatives of the British China Clay Producers' Federation on behalf of the china clay producers of Devon and Cornwall, and a representation of the Transport and General Workers' Union on behalf of the china clay workers, an agreement has been effected between the parties, chiefly on the question of wages, overtime, holidays and Sunday labour. About 4,000 china clay workers in Devon and Cornwall are affected. The Federation is unable to make any advance on the increase made in April last, but will reconsider this matter with the Union in December next, and see whether the amount claimed could be given as from January 1, 1937. Regarding Sunday labour, it was agreed that when obligatory maintenance work had to be performed the men will be paid at a rate and a half. It was agreed that Christmas Day and Good Friday shall be holidays with pay, and the Federation will consider the other Bank Holidays at its next meeting. The note issued by the Federation expresses the hope that in the interest of uniformity and for the avoidance of unnecessary disputes, producers generally will adopt and carry out the agreement.

IN CONNECTION with the anticipated review of certain trade agreements the Import Duties Advisory Committee has received applications for increases in the import duties on wood flour and sodium chlorate. Representations should be addressed in writing to the Secretary, Import Duties Advisory Committee, Shell-Mex House, Strand, London, W.C.2, not later than November 5.

TWENTY-FIVE MILES OF GOODS will be displayed at the British Industries Fair in February, 1937. A new and cleverly-designed booklet, of which more than 100,000 copies are printed, called "From a Power Plant to a Powder Puff," illustrates the astonishing range and contrasts to be found in this greatest of national trade fairs. This booklet, which is published in ten languages, is to be sent to nearly 100,000 known buyers in 110 countries.

THE USE OF SYNTHETIC RESIN MATERIALS for aircraft construction is being investigated and developed by Aero Research, Ltd., a private and independent enterprise whose laboratories and workshops at Whittlesford, near Duxford, were formally opened on October 5. The director is Dr. N. A. de Bruyne, who has been engaged in this work for the past year or so with the financial support of the Aeronautical Research Committee and the Department of Scientific and Industrial Research. In the absence of Mr. H. T. Tizard, chairman of the Aeronautical Research Committee, through illness, the building was opened by Mr. D. R. Pye, deputy director of scientific research at the Air Ministry.

THE DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH is again to have a stand at the Cardiff Engineering Exhibition which will be held at Greyfriars Hall, Cardiff, from November 18 to 28. On this occasion, the exhibit presented will deal entirely with the fuel research activities of the Department and in particular with those of the Coal Survey, the object of which is to ascertain the physical and chemical characteristics of the coal in the various seams underground, as they are, or might be, mined and placed on the market. The methods used in the analysis of the coal will be illustrated, together with those for examining its suitability for different purposes, such as carbonisation, hydrogenation, etc.

THE LATEST EDITION of "Chemicals by Glyco," published by the Glyco Products Co., New York, contains a number of interesting additions, including a special formula section where suggested formulæ are given of interest to many different industries. An innovation which should prove of great value to chemists and technicians is the policy of supplying special assortments of chemicals according to classification. For instance, if a chemist is working on an emulsion problem, he can obtain a series of emulsifying agents which he can easily try for his particular problem.

THE OUTPUT OF BY-PRODUCT SULPHURIC ACID at copper and zinc plants in 1935, in terms of 60° Be. acid, amounted to 603,627 short tons, of which 160,151 tons were produced at copper plants and 443,476 tons at zinc plants. The acid reported is exclusive of that made from pyrites concentrates in Montana and Tennessee. At zinc plants 23,570 tons of sulphur were used to supplement the gases derived from the roasting of zinc blende, and 90,884 tons of sulphuric acid were produced therefrom. No sulphur was used at copper plants. In 1934, 575,660 tons of by-product sulphuric acid were produced. Of this amount 168,676 tons were recovered at copper plants and 406,984 tons at zinc plants. Sulphur amounting to 23,424 tons was used at zinc plants for the recovery of 89,162 tons of sulphuric acid.

THE NEW SOAP FACTORY at Sutton, Co. Dublin, will open during the present month. The firm and capital will be 100 per cent. Irish and will give employment to over 60 people. The factory is being opened by Deverell and Co., soap manufacturers, of Dublin. Mr. Sean Breaden, a leading member of the firm, stated that they did not intend to compete with existing Irish companies, but aimed at supplying what was now being imported. One of the most important things would be a special antiseptic soap, for which there was already a market. They would also cater for the textile trade, and were now producing a special cleanser for dairy utensils. Experiments, virtually assured, to extract certain salts from seaweed were well advanced, and it was hoped to produce soon what would be known as "seaweed soap."

APPOINTMENTS VACANT

(2d. per word; minimum 18 words; 3 or more insertions, 1½d. per word per insertion. Sixpence extra is charged when replies are addressed to box Numbers.)

ACID RESISTING WARE. Wanted Salesmen calling on Chemical and kindred works to take up additional agency in above. Apply Box No. 1787, THE CHEMICAL AGE, 154 Fleet Street, E.C.4.

"FRENCH MANUFACTURERS of fine colours for printing inks, etc., cosmetics, open to appoint first-class firm with good connection as sole agents for Great Britain and other markets."—Apply, Box No. 1788, THE CHEMICAL AGE, 154 Fleet Street, E.C.4.

TECHNICAL ASSISTANT (unpensionable) required. Degree in Chemistry or its equivalent, with physics as a subsidiary subject essential. Training and experience in mechanical engineering desirable. Age not normally to exceed 35 years. Preference and age concession to ex-Service men. Salary £246 to £367 per annum, according to qualifications. Candidates should apply by letter to Chief Superintendent, Ordnance Factories, Royal Arsenal, Woolwich, S.E.18, giving full particulars of experience, positions held, etc.

FOR SALE

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CHARCOAL, ANIMAL and VEGETABLE, horticultural, burning, filtering, disinfecting, medicinal, insulating; also lumps ground and granulated; established 1830; contractors to H.M. Government.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams: "Hill-Jones, Bochurch, London." Telephone: 3633 East.

'Phone 98 Staines.

2 JACKETED TANKS 8 ft. × 8 ft. × 1 ft. deep: Bonecourt Gas Fired Boiler 3.B 120 lb. w.p.: Jacketed Mixer "Z" Blades, 38 in. × 36 in. × 30 in.: Morton, Melvin and Reads 3-speed 80 qt. Mixers: Brass "Z" Blade Mixer, Pan 32 in. × 22 in. × 18 in.: 2½ Carter Disintegrator, as new: Triple Granite Refiner 24 in. × 12 in.
HARRY H. GARDAM AND CO., LIMITED, STAINES.